

American Aviation

MANAGEMENT
ENGINEERING
OPERATIONS
MAINTENANCE
EQUIPMENT

DEC. 22

1952

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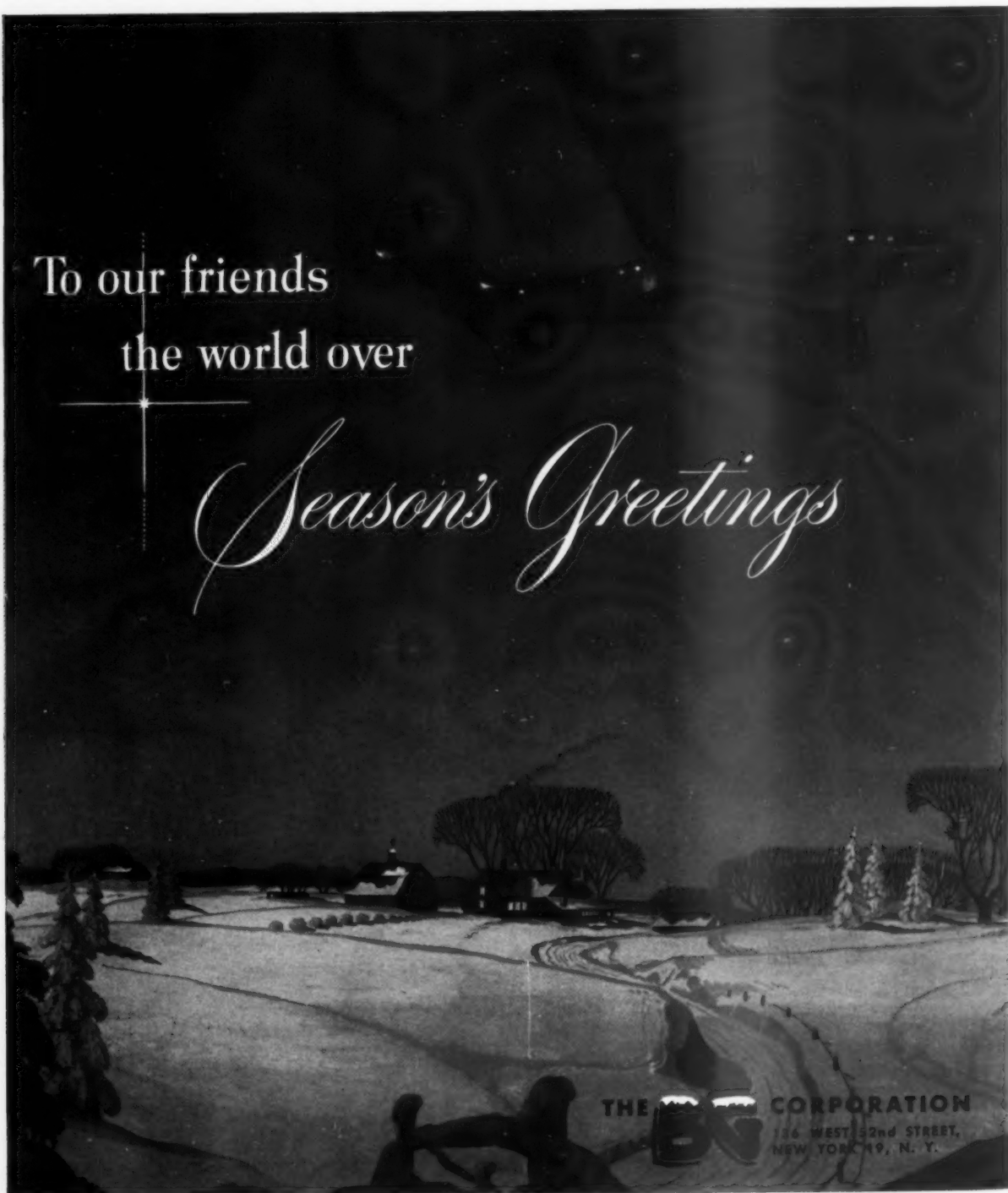
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AIRTRENDS

Look for early Congressional action on broad re-evaluation and re-examination of defense program and functions of armed services. It will be authorized by one of the first bills introduced in January. Eisenhower has given unofficial blessing.

There may be more AF and Navy contract cutbacks on aircraft. Production stretch-out delayed delivery dates on some types to the point where they'll be competing with much more advanced types in the same category.

U. S. jet engine makers are turning out 60 powerplants daily, against 17 a year ago. Industry will be meeting Air Force schedule within a matter of weeks.

Air Force will boost by 50% the money it will spend with privately owned aircraft and engine maintenance facilities during next fiscal year. About 60% of AF's work will be done outside, compared with present 40%.

Decision on the Convair supersonic bomber enhances Boeing's jet tanker/transport project (referred to as Project X and the B-707). Bomber will need high-speed, high-altitude refueling for reasonable range.

Local service airlines believe that if a foreign manufacturer, such as Fokker or Canadair, announces production of a feeder transport, it will prod loose a similar move by a U. S. plane maker.

A reverse thrust device for jets, which will shorten landing runs, is expected in time for first commercial jet operations in the U. S. General Electric is well along with its project, and SNECMA, French nationalized engine company, is already testing its device.

CAA is expected to ask \$27 million for fiscal 1954's Federal Aid Airport Program, and \$40 million for the following year. Major projects have been deferred in past two years because of constantly decreasing appropriations.

CAB Member Chan Gurney (a Republican) seems certain of reappointment when his term expires at the end of this month. White House is agreeable and is said to have informal clearance from Eisenhower headquarters. Nyrop vacancy probably won't be filled until new Administration takes over.

Recent CAB cease-and-desist order to Pan American World Airways may serve as industry guide on free and reduced-fare transportation. Board's order outlaws some practices, spells out others that may be permitted.

The Washington View

Auto-makers as Engine-makers

Air Force officials won't say so flatly, but they keep hinting broadly that they are not satisfied with the way automotive firms which have been ordered to build aircraft engines are doing the job. Latest indication was given by USAF Under Secretary Roswell L. Gilpatric when he reported that automakers seem to be "cocksure" about their ability to turn out precision aircraft power plants in the same manner they mass produce engines for cars. He declared the auto industry companies are encountering "quality control problems" when they produce plane engines, especially jets.

There is no question but that companies like Ford, General Motors, Nash, Kaiser-Frazer and others in the automotive industry can do an effective job in turning out aircraft power plants. They proved that during World War II.

Nor can it be argued that prime aircraft engine producers such as Pratt & Whitney, Curtiss-Wright, Allison, G.E. and Westinghouse, who can and do produce power plants in quantity when the occasion demands, are nevertheless basically development firms. In the best interests of engine production, might it not be a good idea for auto firms to work a little more closely with the aircraft firms which developed the engines in the first place and which are more familiar with the producibility problems?

Job Lots

The Eisenhower administration still has several thousand non-civil service government jobs to pass out and many directly concern aircraft companies and airlines. Not counting such posts as USAF secretary and assistant secretaries and corresponding positions in the Navy, Commerce under secretary for transportation, and CAA administrator, here is a partial breakdown. Commerce Department 12,396; NSRB 31; ODM 38; Secretary of Defense's office 247; USAF 2,690; Post Office 39; AEC 6,687; CAB 71; DMPA 34; DPA 22; MSA 95 ICC 48; and NACA 1. In all, 170,382 Federal positions are unprotected or exempt from civil service status.

Million Dollar Economy

It isn't easy to try to reduce and budget by \$1 billion, but the Air Force has set up a team to do just that for the coming fiscal

year. A Spare Parts Study Group is hoping to make up the reduction of USAF 1954 procurement funds from 38% to 30% by making savings in nine separate categories. They include:

- Establishing a separate control system for high-value parts, including engines.
- Trying to cut down the time spares are in the pipeline.
- Revising stock and consumption records.
- Possibly establishing aircraft project teams to be spare parts specialists.
- Studying the lead time of spare parts arrival on the scene of operations.
- Checking engineering changes to eliminate certain spares completely.
- Reducing the number of spares, especially in supply lines.
- Standardizing configurations, thus reducing various models of similar-type spares.
- Sifting configurations to see which parts can be eliminated or simplified.

The Shrunken WSB

President Truman apparently has found a partial solution to the paralysis which permeated the national Wage Stabilization Board after seven industry members and the chairman quit in protest over his decision to give the coal miners the full \$1.90 a day wage hike. He told public members to act alone, but it is doubtful that aircraft labor unions will be satisfied with the action.

After the Washington resignations were followed by similar industry walkouts in several regional WSB's, Economic Stabilizer Roger Putnam tried to line up industry replacements. He reported several qualified management men had agreed to serve on the WSB, but when the U. S. Chamber of Commerce and the National Association of Manufacturers called for a boycott of the board, these men changed their minds and Mr. Truman could only trim the Board to its public members, with labor representatives taking an advisory role.

The reduced board was expected to act first on cases in the aircraft, electrical, shipping and maritime industries because labor leaders had warned there might be a rash of protest strikes if contract agreements in these big cases were not approved. Contracts affecting at least 200,000 of the 750,000 employees in the aircraft industry are now before WSB for its okay.

... Robert M. Loebelson

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Meet Your Editors



Murphy

OVER AMERICAN AVIATION's technical editor's desk, you can see a framed citation, beautifully hand-embossed in black, red, and gold letters. In part, it reads:

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Joseph S. Murphy

"In recognition of outstanding service, and for constant devotion to the best interests of air transportation . . ."

Signed: C. R. Smith, President

G. J. Brandewiede, Vice Pres.-Maintenance & Supply.

Knowing that citations such as these are not handed out in any quantity, here is something certainly both Joseph Stephen Murphy and AMERICAN AVIATION can well be proud of.

• • • • •

Joe Murphy's a rarity on the editorial staff. He's probably the only native-born Brooklynite here . . . born in the heart of the Dodger's habitat on October 4, 1918. However, Joe moved out of Brooklyn when he was one, to Freeport, Long Island, N. Y. After graduating from high school, he attended Columbia University for awhile, studying engineering.

After this, Joe's first six business years were with the New York Central, in operations, accounting, and freight departments. As in the cases of Editors Preble Staver and Bill Henzey, Joe also found rail travel a bit slow and entered aviation.

In 1943, Joe Murphy joined American Airlines at LaGuardia Field, N. Y., soon becoming editor of the carrier's maintenance and service fleet manuals. He held this position for three years and then advanced, taking over AA's liaison work with the CAA and ATA on maintenance and engineering matters.

Joe's next step upward was his move to American's main base in Tulsa, Oklahoma. This was in 1950, during AA's reorganization of its maintenance and supply departments. His outstanding work there brought him the citation that we quoted above.

Early this year, when Bill Perreault was upped to the post of managing editor, the technical editor's job was open. Joe accepted our invitation and he and wife, Virginia, and Jim and Jo Ellen (aged eight and three respectively), moved to Washington this past Memorial Day week-end. Now they are happily settled in Hyattsville, Maryland.

The Murphys say they were all glad to swap Oklahoma's heat for that of the District of Columbia. However, a few days after his arrival Joe found himself pitching for our softball team in a temperature that hovered around 104° F. in the shade!

Since Joe came with us in June, he has taken over the writing and editing of several AMERICAN AVIATION features, such as the "New Products" pages, and the "Maintenance Bulletin Board" section. No doubt you've read and enjoyed Joe's special articles as well. These range from stories on autopilots to ignition analyzers and helicopters, proving the Murphy versatility in handling technical matters.

All's well today, but there's just one big problem on Joe's hands right now. He wants to keep his "Maintenance Bulletin Board" packed with more of the many new ideas engineers and maintenance men in the industry come up with. So if you have some of these ideas or know of new ways to do old jobs more efficiently, by all means mail them in to Joe Murphy. He'll welcome them and the industry will get their full benefit, which is most important of all to us in this field.

When & Where

Jan. 8-9—Symposium on automatic computing equipment, sponsored by Midwest Research Institute in cooperation with ASME, ASCE, AICE, ISA, AIEE, IRE, and SAE. Kansas City, Mo.

Jan. 12-16—SAE Annual Meeting and Engineering Display, Sheraton-Cadillac Hotel, Detroit.

Jan. 14-16—AIEE-IRE-NBS Conference on High Frequency Measurements, Statler Hotel, Washington, D. C.

Jan. 19-23—Winter Meeting, American Institute of Electrical Engineers, Statler Hotel, New York.

Jan. 26-30—Institute of the Aeronautical Sciences, Annual Meeting, and Honors Night.

Feb. 12-13—National Aviation Education Council, Annual Meeting, Atlantic City, N. J.

Mar. 13—Institute of the Aeronautical Sciences, 8th Annual Flight Propulsion Meeting, Carter Hotel, Cleveland, Ohio.

Mar. 25-27—SAE, Production Forum, Statler Hotel, Cleveland, Ohio.

Mar. 31-Apr. 2—1st International Magnesium Exposition, National Guard Armory, Washington, D. C.

Apr. 20-24—SAE, Aeronautic & Aircraft Engineering Display, & Aircraft Production Forum, Hotel Governor Clinton, New York.

International

Jan. 13—IATA, Coordination Summer Timetables, Paris.

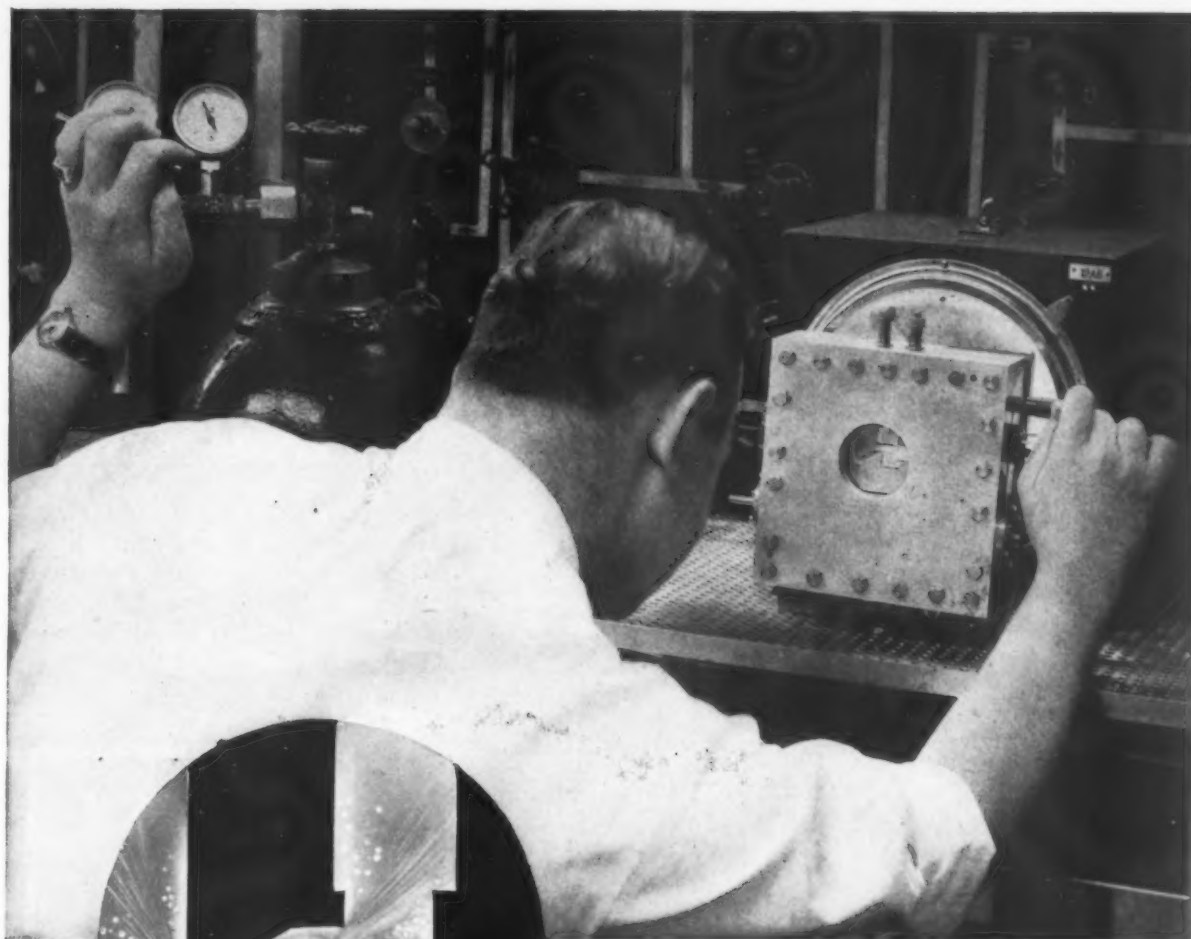
Feb. 16—IATA, Ops Sub-Committee, 4th Meeting, Montreal.

Feb. 23—IATA, Technical Committee's Administrative Panel, Montreal.

Feb. 24—ICAO, First Air Navigation Conference, Montreal.

Mar. 23—IATA, Medical Committee, 3rd Meeting, Estoril, Portugal.

Apr. 20—IATA, 6th Technical Conference, Puerto Rico.



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Letters

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AVIANCA & THE MAILS

(The letter below refers to an article written by John M. Redding, Assistant Postmaster General-Transportation, which appeared in the October issue of "Post Haste," published by the Post Office Department's Bureau of Transportation. It was based on a visit to Colombia made about a year ago by Mr. Redding.)

In Colombia, Avianca operates the air mail service. The government has nothing to do with it. The airline sells stamps, furnishes mail boxes, handles all ground transportation, flies the mail to destination, and delivers it. The government receives the 2.4¢ surcharge on each letter and 3% of the 6¢ air mail charge.

Mr. Redding states that the government is dissatisfied with the \$600,000 it received last year from Avianca and wants to nationalize the air mail. Foreign postal experts, called in to examine the government's assets for the International Bank, recommended a loan to help Colombia modernize its postal system, but only if Avianca's postal facilities are turned over to the government, he says. Some quotes from the article:

"In its 30-year history Avianca has dealt successfully with government interference and competition and, so far, has managed either to 'kill 'em or join 'em' . . .

"Avianca dealt the final blow by denying Lansa the use of its landing fields, which previously had been jointly used . . .

"One businessman told me: 'If we could pry Avianca loose and let the Post Office go in with a new broom, maybe we could sweep out all the red tape that has grown up in air mail' . . .

"... the Colombian government recognizes the need for a renovated and up-to-date air mail postal system. Nor is it likely that having friends in high places within the government will aid Avianca in its present fight to hold onto its profitable mail monopoly. Only by ending the Avianca clutch on air mail can the . . . government successfully negotiate the International Bank loan which is sorely needed to exploit the wealth that lies within the vast reaches of Colombia's hinterland.

"It remains to be seen whether Avianca can fight off this most serious of all threats to its interests. Meanwhile the world's only private postal monopoly grinds on, piling up profits while it can."—Ed.)

To The Editor:

In the October issue of a U. S. magazine named *Post Haste* appears an article entitled, "Avianca—Colombia's Private Air Postal Monopoly." Because

the magazine, which is published by the Bureau of Transportation, is presumably supported by public funds (no subscription price being noted), because the author of the article is a ranking public official of sub-cabinet status, and because the article itself is inaccurate, misleading, scurrilous and in at least one instance just short of libel, I am taking the liberty of addressing this letter to you.

While using the term "private monopoly" in the title to the article, nowhere is there mention that the postal service rendered by Avianca is by delegation from the Colombian Government. In this sense air mail in Colombia is just as much a public service as national mail, the national telecommunications system, or the various municipal telephone companies.

The entire system operates under the surveillance of the government, with government interventores assigned to the principal offices (with salaries for the account of Avianca); rates and regulations applying to the air mail service have government approval and may not be altered without the prior knowledge and assent of the authorities. The article creates the impression that Avianca is a completely free agent in such respects.

Contrary to the article, the stamps are not printed by Avianca but ordered from the government and paid for by Avianca. It will be noted that in air mail surcharge is equivalent to that applying to domestic air mail in the United States, but from this Avianca provides all the ancillary services of maintaining post offices and personnel, providing local delivery, surface transportation to and from airports, and further absorbs the cost of off-line transportation, i.e., railroad, truck, etc., to the ultimate destination.

The national surcharge, equivalent to roughly 30% of the air mail charge, is therefore practically a net return to the government, a situation which the government itself has thus far not seen fit to alter. This is what prompted Mr. Eric Bramley, in an earlier and much more enlightened report on Colombian air mail organization, to describe the system here as "subsidy in reverse." In this connection it would be well to recall the collapse of the late but not so much lamented "Taca de Colombia" despite its tender to transport the mail free for the government. Neither TACA nor the Government could effectively match Avianca's all-inclusive system of air mail service.

That the demise of the former Lansa was brought about by Avianca's refusal to permit use of their landing fields is also in error. Even after Avianca opened its privately owned airports to "all comers," including Lansa, in 1947, at rates which are the same as we pay at government-owned fields, the latter company continued crazily building more and more airports until the bottom of the barrel was reached last year. Had a different policy been pursued it

is conceivable that Lansa would today be fully autonomous instead of a reduced-rate carrier under the aegis of Avianca.

Hardly a single business man in Colombia would agree with the author's implication that administration by the government would vastly enhance the efficiency of the present system. The "one business man" quoted has probably remained unidentified at his own request to avoid the risk of having his head shrunk by the detachment of head-hunting Indians privately subsidized out of Avianca's "profitable mail monopoly." That Avianca derives a profit from the mail service is not denied; nor is it incumbent on private enterprise to provide its services at cost.

But the implication that the profit which Avianca derives from this source is excessive or disproportionate is entirely erroneous. It is our contention that were the government to assume the burden of air mail administration, relieve us of the high costs entailed by the ancillary services, and pay us for the transportation of mail on a compensatory rate basis, we would be better off economically. However, public opinion with respect to such a development, is overwhelmingly that rates would go up while the quality of service would deteriorate.

During 1951 air mail revenues of the American flag carriers serving South America ranged from a low of 17.2% of the gross revenues of Panagra to a high of 42.2% of the gross revenues of Chicago & Southern; on an average the 11 U. S. certificated international carriers derived 22.1% of their gross revenues from air mail payments last year.

In the case of Avianca, air mail accounted for 8.9% of our total revenue during the same period! Whereas the payments to the American flag carriers were for transportation services exclusively, Avianca had to defray the cost of all the indirect services as well out of its air mail income.

Expressed as mail pay distributed over the total revenue miles flown, the situation was as follows during 1951:

	Mail Pay per Revenue Mile Flown
Chicago & Southern Air Lines	\$1.107
Braniff Int'l Airways	0.629
Northwest Airlines	0.695
Pan American World Airways	0.671
Pan American-Grace Airways	0.462
All U. S. Certificated Int'l Air Carriers	0.636
AVIANCA	0.139

All of this is not to deny that debate on air mail has been a frequent, in fact almost perennial, issue in Colombia. On the contrary, it is some of the favorite political fodder of freshmen politicians and young ministers in

this country. However, until the appearance of the Post Haste article this had been a strictly intramural affair.

Now, according to the author, we find the World Bank holding a club over the Colombian government to terminate Avianca's "clutch" on the air mail, otherwise the credits which the government seeks cannot be successfully negotiated. This observation, in addition to its fundamental inaccuracy, constitutes an indignity to both the Colombian government and the Bank.

Credits have been extended—for highway construction, for hydro-electric projects, and agricultural expansion—and more are anticipated. Within this same program negotiations are well ad-

vanced toward the establishment of an airport corporation which would serve to unfreeze some 8 to 10 million dollars which Avianca has tied up in airports, a prospect which we welcome very much.

At no time in the course of these negotiations has any representative of the Colombian government or the World Bank so much as intimated that the credit sought in this connection be conditional on relinquishment by Avianca of the air mail administration.

Finally, it is hoped that future visitors from North America, especially those who because of their official capacity are recipients of the cordiality and hospitality of this country, will be

more temperate and less prejudiced with respect to the institutions which exist here.

GREGORIO A. OBREGON

President
Aerovias Nacionales de Colombia S. A.
(AVIANCA)
Bogota, Colombia

LEADERSHIP

To the Editor:

* DECEMBER EIGHTH ISSUE AMERICAN AVIATION JUST REACHED MY DESK HASTEN TO EXPRESS MY PERSONAL SINCERE APPRECIATION AND THAT OF MY ASSOCIATES FOR YOUR EXTREME GENEROSITY IN SPACE AND TREATMENT AFFORDED TO FIRST ANNOUNCEMENT OF OUR NEW SUPER CONSTELLATION INTERIOR. OF COURSE WHILE EXPRESSING MY SINCERE APPRECIATION I MUST ALSO COMPLIMENT YOU AND YOUR STAFF FOR YOUR QUOTE FINGER ON THE PULSE UNQUOTE LEADERSHIP RECOGNIZING THE IMPORTANCE OF THIS NEW DEVELOPMENT IN AIR TRANSPORTATION. WARMEST REGARDS.

LEONARD SCHWARTZ

(General Sales Manager
Lockheed Aircraft Corp.
Burbank, Calif.)

THE C-46 DEFENDED

To the Editor:

On Page 40 of the December 8 issue of AMERICAN AVIATION there appears an article entitled "Flight Safety Explodes the Myth of Three." I should like to call your attention to the lead paragraph in this article which I believe leaves an erroneous impression in the mind of the reader. This paragraph reads as follows:

"A year ago, on December 15, 1951, there hadn't been a fatal accident among the U. S. international or domestic airlines, scheduled or irregular, for 113 days. Then, on December 16, a Curtiss C-46 crashed at Elizabeth, N. J., killing 56 people. Two others followed in quick succession at Elizabeth, one on January 10 and another on February 10."

The only plane cited in this paragraph is the Curtiss C-46 and the impression is left that all three accidents involved Curtiss C-46's. Actually, as you know, the crash on January 10 was of an American Airlines Convair 240 and the crash on February 10 was of a National Airlines DC-6.

Because the company which manufactured the C-46 is no longer manufacturing airplanes, there is no vigorous company sponsor to head off unjust criticisms of this plane. We feel that it is a safe and dependable airplane, an asset to the pool of air transportation available to the nation, and therefore deplore the impression created by a lead paragraph such as the one I have cited.

With kind regards.

RAMSAY D. POTTS, JR.

President,
Independent Military Air
Transport Association

AMERICAN AVIATION



Facts and Figures!

Figure:

Its pulchritudinous possessor, Barbara Lewis, has a package for YOU containing our hope for your happiness at Christmastime. Dark brown hair, green eyes. We figure more grownups (i.e., quality-conscious male customers of Southwest Airmotive) would believe in Santa Claus if the Old Gent stuck to his diggin's at the North Pole and delegated his chimney-chuting chores to less-lumpy lovelies like Miss Lewis.

Fact:

Eight thousand owners and pilots in the past year relied on Southwest Airmotive

for all, or part, of their aircraft service. They came from 38 states and three foreign coun-

tries. There has to be a reason for such popularity. The reason: Quality.



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HERE'S DRAMATIC PROOF of the damage an arcing fault can cause in an aircraft. To get this picture, G-E engineers arranged a mockup of an aircraft electrical system, then touched the generator power cable against a test airframe. Note the white-hot glare at point-of-contact!

G-E "PROTECTION RESEARCH" REDUCES ARC-FAULT HAZARDS IN AIRCRAFT



G-E AVIATION SPECIALIST and customer discuss protective measures for commercial air transport. G-E protective systems are now installed on DC-6Bs, Stratocruisers, the Navy's new F3H, and Lockheed Constellations.

Each week, G-E engineers at Schenectady, N. Y., are furthering their "protection research" on aircraft generator systems. And a single glance at the above photograph will tell you why.

One serious arc-fault like that shown above, in just one of your aircraft, could cost more than protective devices for an entire fleet. That's why today G-E protective panels and associated components are being designed to give generator systems *maximum* protection.

Your planes can now be safeguarded against excessive overvoltage . . . ground faults . . . undervoltage . . . reverse current. And these protective features, in turn, mean greater flight safety for passengers and crew.

Why not look into G-E protective-engineering facilities for your new aircraft generator systems? In addition to the a-c and d-c panels and components now being produced, complete design and production facilities are available. Contact your nearest G-E Aviation Specialist. Or, write Section 210-48, General Electric Company, Schenectady 5, N. Y.

You can put your confidence in—

GENERAL  ELECTRIC

Editorial

Policy for West Germany

THE POSITION of West Germany in the defense of Europe will come to the front very rapidly as the time for action on the peace treaty draws closer.

A few weeks ago this editor visited some of the German aircraft industry heads in West Germany and found, as might be expected, that German industry is most anxious to participate in parts production for aircraft. A few parts contracts have already come their way from England and the Netherlands, but these are only dribbles and the

Germans have a vast amount of facilities available for big output.

It is no secret that the defense goals of the NATO countries have failed of fulfillment by a wide margin. It is no secret that some European countries don't have their hearts in a big defense program. Some of them have but meager facilities to start with. The best production facilities and the best production brains are in West Germany, our late enemy.

Germans Confident

The signs are many that West Germany will again become a vital industrial nation. The Germans work and they work hard. They organize. They also excel in research, as witness their leadership in the rocket field during World War II. Neither the French nor the British want to see the Germans forge their way to a top position again, but the realities of today's situation dictate that the Germans be used in any program for the defense of western Europe.

The German leaders with whom this editor talked are confident that, given the chance, they can develop weapons which will be capable of stopping the Russians at the Elbe. Not the Pyrenees, not in the Mediterranean, and not the Rhine. But at the Elbe. With natural self-interest the Germans aren't interested in a defense program which would automatically give up their territory to the Russians in the event of attack from the east.

Any military expert will say that it is a calculated risk, at best, to have research and production facilities so close to the Russians. Hence the basic aviation facilities should be in North Africa and other places far away from the combat areas. Yet it may not be a matter of choice if western Europe is to prepare for adequate defense, for the simple reason that only the Germans, out of all of the European peoples, are capable of all-out large-scale production.

The French, again quite naturally, are fearful that a revived German industry could again be

turned westward and not used for the defense of the west. The French are proposing a joint collaboration with the Germans in building up an aircraft industry in North Africa. This plan has merit provided that existing facilities in West Germany, those which are now available, can be used as well. It takes a long time to build up industry from scratch in a new location such as North Africa.

Some hundreds of German engineers went to Russia after the war, most of them involuntarily. It is estimated that half of these are now back in Germany. It is clear from inside reports that the Russians are relying less and less upon German engineering. At present the manpower and physical resources of West Germany are not being utilized for defense purposes; indeed such use is banned by the occupation agreements. But when the treaty is signed, these facilities can be used under the restrictions of the treaty.

Germany is "coming back" and this fact might as well be fully admitted and appraised. The German airline plans are published exclusively in this issue of the magazine. There are calculated risks no matter what happens and what course is taken. It would seem to us that the realities call for utilizing German engineers and production facilities in some integrated manner in the entire western defense plans. The realities indicate that there is no time to be lost. It will be a long time indeed before West Germany can conceivably become an offensive menace; in the meantime it should be used for defensive work.

Gross Abuse

The airport fraternity which has suffered under the various economy moves of Secretary Charles Sawyer will be pleased to know, we're sure, that Mr. Sawyer's penchant for economy doesn't extend to all of his activities. Just before the November 4 elections he took a 19-man group for a tour of Europe, supposedly to foster trade relations. He commandeered the CAA's research C-47 for a solid month, although N-17 could carry only ten passengers, at a time when the plane was needed for checking U.S. civil aviation installations, and when the Air Force has a VIP fleet available for just such junketing purposes. At one point the CAA plane deadheaded from Paris to Milan to carry ten of the party the short distance from Milan to Rome. Some civil government employees had to fork up money from their own pockets to pay for in-flight lunches which the Sawyer crowd ordered without offering to pay. It was one of the grossest mis-uses of a government airplane since World War II. So Secretary Sawyer wanted to economize, eh?

... WAYNE W. PARRISH

AMERICAN AVIATION



A Mightier Cutlass Comes Aboard

The latest in the Cutlass family—the Chance Vought F7U-3—has gone to sea.

The Navy has completed extensive carrier qualification tests with this new airplane.

With its more powerful engines, greater performance and load carrying ability, varied armament and long range, the Cutlass offers the Navy an exceptionally versatile high performance shipboard weapon, a worthy successor to the famous, and still active, Chance Vought Corsair.

A Cutlass was the first swept-wing jet to take off and land aboard a carrier. The F7U-3 soon will join the fleet in quantity to make the swept-wing, tailless configuration a familiar sight on the high seas.

For thirty-five years, Chance Vought Aircraft has been producing aircraft to meet the exacting requirements of the United States Navy. As Cutlasses continue in production, Chance Vought will continue to modify and improve these aircraft to meet the Navy's changing operational needs.

Chance Vought Aircraft • DALLAS, TEXAS

ONE OF THE FOUR DIVISIONS OF UNITED AIRCRAFT CORPORATION

Christmas Spirit in Short Supply

THE "battle of the budget" is on again. This is the annual battle between the Air Force and the Navy for aviation appropriations, a propaganda see-saw aired in the public press, complete with claims, counter-claims, deprecations and innuendo on the part of each service with the idea of creating a public impression that there is no earthly need for the other service in air operations.

Perhaps "on again" is not completely accurate. To our knowledge there has never been a cease-fire; it is a perennial battle, resting dormant at times only to flare anew at the drop of a controversial statement. But it is "on again" in the sense that it seems to reach an annual peak of intensity just before Congress sits down to dole out the dollars.

No one is quite sure when the battle originally started. It was on during World War II, but subordinated to the urgency of the moment. After the war, the Air Force (then the Army Air Force) seized gleefully upon the report of carrier operations in the Pacific and the Navy just as delightedly pored over the Strategic Bombing Survey and each side "proved" conclusively that the other had absolutely nothing to do with winning the war. The creation of an independent Air Force touched off a new squabble, the Navy apparently feeling that such recognition of the fledgling service constituted a threat to its own air expansion plans and the Air Force apparently being of the mind that scuttling naval aviation offered a means of building up its own empire. Paradoxically, the separation of the Air Force from the Army was part of the "Unification" Act.

The post-unification battle crescendoed into 1949's investigation of the Air Force's B-36, a Navy-inspired inquiry which developed into what was probably the most contumelious extravaganza ever staged on Capitol Hill.

New Rumblings

In the last month, however, there have been rumblings of a new brawl which might even top the B-36 do for sheer intensity. It had been building up for some time, some echelons of the Air Force feeling that the Navy's announced plans for a fleet of 60,000-ton carriers handling big bombers like the Douglas A3D was an encroachment on the USAF's divine right of strategic bombing, while some echelons of the Navy felt that the USAF was out to sabotage its big carrier program. (We say "some echelons" because there are a large number of civilians and officers in each camp who think that the whole argument is juvenile nonsense.)

Under Secretary of the Air Force Roswell L. Gilpatric, perhaps unwittingly, lit the fuse to the latest explosion by stating an opinion publicly: "Duplications could be avoided and money saved if one uniform air force were established to replace the four (USAF, Navy, Army, and Marine Corps) now in operation."

About the same time, *Air Force Magazine*, house organ of the Air Force Association, let loose a dual blast at the Navy. It picked apart the Navy exercise "Operation Mainbrace," hammered at the alleged inefficacy of carrier operations, and lashed together a batch of questionable statistics to point up the size and cost of the supporting units necessary to keep a carrier task force in action.

In the same issue, AFA took the Navy to task for its "guided missile" farce in Korea, in which some overzealous propagandist played up the use of ancient remote-controlled drone aircraft as the first use of guided missiles in combat. (Even some die-hard Navy zealots of our acquaintance had to admit that this fell somewhat short of the best public relations stunt of the century.)

Navy League Acts

The Navy was jolted into action, and through its civilian mouthpiece, the Navy League, it let loose a broadside against Gilpatric and the AFA, stating that "the two attacks were hardly sheer coincidence" (although we will bet a Stevenson button that they were). The League charged a deep, dark plot on the part of the Air Force to propagandize Congress and the incoming Administration and defended carrier operations by citing some equally questionable figures to show that the Air Force land-based equivalent of a carrier task group would cost five times as much to accomplish the same job.

Then Navy Secretary Dan Kimball joined the fray. In a speech prepared for delivery before the Navy League, he took a shot at Gilpatric's "one air force" theme. However, after having been released, the speech was hurriedly recalled and a new paragraph substituted for the one which alluded directly to Gilpatric's remarks. Nonetheless, the newspapers, which thrive on controversy, printed both versions of his speech.

These were the opening salvos of what promises to be a broader brawl. The battle is now raging, sub rosa, on all levels of both services and there are indications that the Congressional budget hearings, which will start after the first of the year, will provide some high-octane fuel for the fire.

To this unbiased observer (and we can lay such claim, having been labeled by each of the services biased in favor of the other) this petty bickering between the services is patently silly. The Air Force and the Navy are not Macy's and Gimbel's fighting for the consumer's dollar. They are tax-supported services charged with the defense of the country and they should spend their time thinking up better ways to do it as a team, rather than devoting their attention to trying to snatch a piece of the other's empire in order to build up the number of "star-rank" positions they can dispense to the career boys.

We definitely need a land-based strategic air force, and efforts to belittle it contribute little to national defense. Just as definitely, we cannot dispense with naval aviation.

Perhaps Secretary Kimball in his Navy League speech (expurgated version) put it most aptly when he said:

"The airplane is a weapon, not a way of life. As a weapon, each of the services has certain functions and operations where airplanes are necessary. We must use them as they are suited for the problem. It would be just as ridiculous to say that only one of the services could operate guns, or trucks, or any of the other millions of items that each and all the services need, individually but to a common end—victory."

. . . JAMES J. HAGGERTY, JR.

50 YEARS

OF

FLIGHT

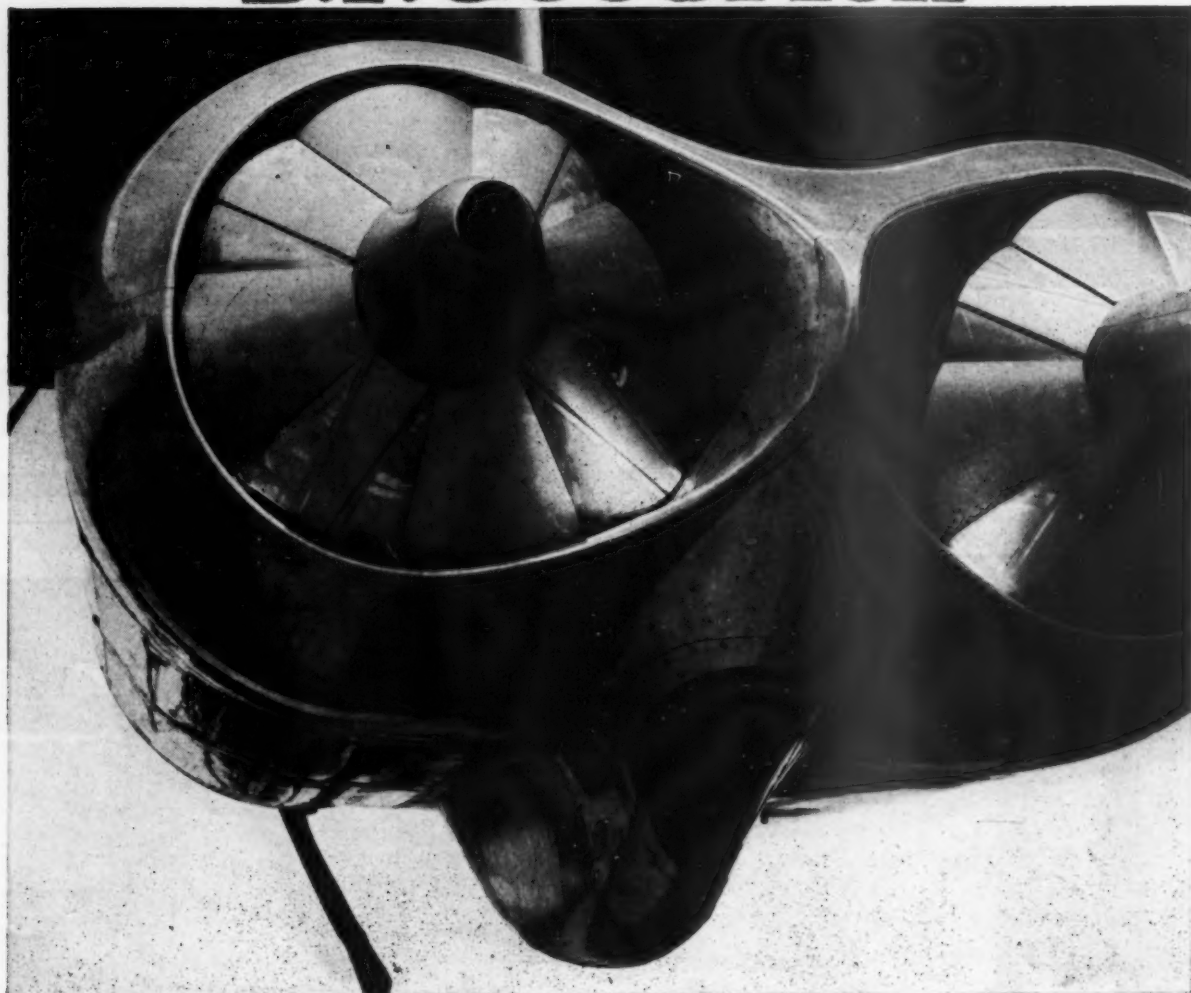


AMERICAN AVIATION extends hearty congratulations to the aircraft industry as it enters its 50th year of heavier-than-air flight. Commemoration of the Wright Brothers' first flight on December 17th kicked off a year-long celebration.

A yardstick of accomplishment in this period is provided by comparative data on the Wrights' "Kitty Hawk" and the 1952 Boeing B-52. The \$1,500 Wright "Kitty Hawk" grossed 750 pounds, averaged 31 miles per hour. The B-52, with prototype cost of over \$21 million, grosses about 350,000 pounds, will top 600 miles per hour. The

four-cylinder engine in the "Kitty Hawk" turned out 16 horsepower; the eight P&W J-57's of the B-52 will develop about 160,000 horsepower at cruise, 10,000 times the "Kitty Hawk's" power. On the first flight, the "Kitty Hawk" barely crossed the wingspan of the B-52.

B.F. Goodrich



Wafer-thin rubber sandwich solves icing problem

THIS JET ENGINE has only a part-time job. It provides extra power when the Convair B-36 takes off, in gaining desired altitude, and for that extra burst of speed needed over target areas. The rest of the time, it has to be covered to keep the air from going inside.

That's the reason for the shutter-like "doors" you see. Doors that *must* open when the extra power is needed. And ice forming in flight could seal the doors tight. Heat had to be provided, yet the shutters had to be almost wafer-thin. The manufacturer of the doors thought he could do it by making the shutters like a sandwich—if the sand-

wich filler could be made thin enough and still provide the amount of heat needed to keep off ice.

The experience of B. F. Goodrich with hundreds of airplane icing problems came in handy on this one. It took some precise engineering to solve the tough problem of thinness, but it was done. The heater that turned the trick is only $\frac{1}{20}$ of an inch thick! The core of resistance wires is imbedded by a unique BFG method into a layer of Fiberglas impregnated with rubber-like material. It provides all the anti-icing heat needed to keep the doors ice-free at all times!

B. F. Goodrich offers the aviation industry a background of almost 25 years' experience in anti-icing problems, working with both heat and pneumatic De-Icers. Other BFG products for aviation include: tires, wheels and brakes; Plastilock adhesives, Pressure-Sealing Zippers; fuel cells, Rivnuts, accessories. *The B. F. Goodrich Company, Aeronautical Division, Akron, Ohio.*

B.F. Goodrich
FIRST IN RUBBER

AMERICAN AVIATION

LUFTHANSA ROUTE PROGRAM



German Airline Looms as World Competitor

Big pre-war carrier, exclusive report reveals, prepares for global expansion in next few years.

By ANTHONY VANDYK

A BRIGHT STAR will reappear in the international airline firmament next year and the stargazers of the world's air transport and aircraft industries have their most powerful telescopes poised to catch the first glimpse of it. Its name is Deutsche Lufthansa, the German flag airline which ranked high among the pre-war candidates for the title of Europe's most admired (and feared) airline.

Revealed here for the first time, from information obtained from authentic and confidential sources in the German aviation industry by Wayne W. Parrish, editor and publisher of AMERICAN AVIATION, and correlated with data from around the world by the author, are the facts on Lufthansa's program.

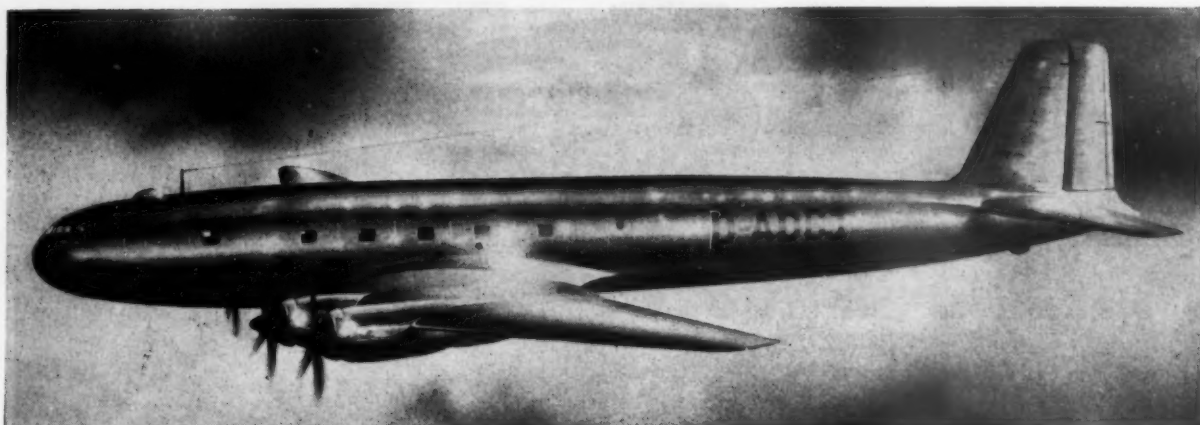
In Western Germany today the finishing touches are being put to plans which will sweep the Lufthansa back into its position as one of the world's top carriers. Everything points to the

inauguration of operations by 1953 with a complete intercontinental network established four years later. Here is the approximate timetable:

• **1953/54:** Initial operations within Europe (including services to London, Paris, Amsterdam, Brussels, Copenhagen, Stockholm, and Zurich), followed by inauguration of trans-Atlantic service to New York.

•1954/55: Opening of a route to South America (terminating at Buenos Aires, via Lisbon, Dakar, Recife, Rio de Janeiro, Sao Paulo, and Montevideo) and extension of European operations to Milan and Rome.

- 1955/56: Inauguration of service to Istanbul and Teheran, and to Barcel-



ALTHOUGH INITIALLY AMERICAN equipment will be used, Lufthansa will undoubtedly give very sympathetic consideration to any products the revived German aircraft industry may have to offer. Photo above shows the FOCKE WULF FW 300, an advanced pressurized transport design which was shelved in 1942. The plane's specs indicated a better performance than that of the Douglas DC-6. Focke Wulf is the only West German aircraft company still in the airframe business, although present regulations restrict its production to sailplanes.

ona, Madrid, and Lisbon.

•1956/57: Commencement of operations to the Far East (terminating at Tokyo, via Cairo, Baghdad, Karachi, Calcutta, Bangkok, and Hong Kong).

A "so what?" attitude to this program might be expected from operators already firmly entrenched on parallel routes, were it not for the fact that, under the provisions of the peace treaty, foreign carriers will be virtually compelled to allow the Lufthansa to share their routes unless they wish to be deprived of their German traffic rights. As Germany today represents big and lucrative business to many of the world's airlines, there is every indication that the door will be opened, in many cases reluctantly, to the German flag carrier.

It is not generally realized just how big and how lucrative this German business is—German authorities claim that foreign airlines are currently netting an annual 95,000,000 marks (equivalent to \$22,500,000 annually), with expenditure in Germany at the rate of only 50,000,000 marks and revenue coming in at the whopping rate of 145,000,000 marks.

Much of this revenue is derived from domestic traffic (Air France, British European Airways, KLM Royal Dutch Airlines, Pan American World Airways, Sabena Belgian Airlines, Scandinavian Airlines System and Swissair all operate extensively within Germany), but the percentage of income from operations out of the Federal German Republic is growing fast, with more and more carriers including Germany on their long-distance international routes.

In recent months BOAC, Iberia, Philippine Air Lines, Qantas Empire Airways, South African Airways and

Trans-Canada Air Lines have joined the ranks of the operators serving Germany.

The importance of Germany to international airlines may be judged from the following figures showing the number of weekly services operated between Germany and the rest of the world: North America, 110; Britain, 97; Turkey/Middle East, 67; Holland, 64; Italy, 55; Switzerland, 52; Belgium, 52; India/Pakistan, 46; Spain/Portugal, 40; Denmark, 38; Greece, 36; France, 35; Sweden, 29; Mexico, 23; South Africa, 20; Far East, 20; Finland, 16; South America, 15; Norway, 15.

Latest available statistics reveal that over one-third of all traffic from Germany in terms of load ton-miles goes to North America and about 23% to Europe.

Although it might seem that the Lufthansa will have a tough time getting going again after being grounded since 1945 and in the face of other operators who are firmly entrenched on all the proposed German routes, the planners in Germany are optimistic. They believe that, not being burdened by having to fly "prestige" services and money-losing routes to colonial territories, the Lufthansa will be able to operate in the black within five years of its revival.

Their estimate is based on the assumption that the government will agree to certain customs concessions for the airline's equipment and spares. This would appear likely in view of the fact that the government will be the majority shareholder (with state governments and private individuals holding minority interests).

The Lufthansa will probably be capitalized at about 150,000,000 D-marks (\$36,000,000), about 90% of which will

be used to provide counterpart funds for dollar loans required to cover expenditure on U. S. equipment and supplies. Biggest item on the financing program is aircraft (\$23,000,000), followed by spare engines and parts (\$7,000,000).

Details of the Lufthansa's choice in equipment are awaited with keen interest by manufacturers and operators throughout the world, even though the total number of aircraft ordered will be not more than a couple of dozen. After very careful consideration the planners have decided that U. S. piston-engine equipment will be adopted in the initial stages. When the full route program is realized Lufthansa will be operating 12 twin-engine and 12 four-engine planes, but the first orders will probably involve very much smaller numbers.

Latest reports indicate that the Convair 340 stands a good chance of selection as the twin-engine aircraft and the Douglas DC-6B or the Lockheed Super Constellation as the four-engine plane. Until the orders for the new transports are fulfilled Lufthansa will operate with used equipment similar to the types it has on order (Convair 240's, DC-6's or Constellations).

A particular requirement exists in Germany for a feeder transport for domestic operations, which, before the war, were the most extensive in Europe, but until Lufthansa is permitted to serve Berlin (under the peace contract the operation of routes to and from Berlin is restricted to the carriers of the Western occupying powers) service within Germany will have a relatively low priority in the general program.

Nevertheless, the Lufthansa planners have been taking a good look at the Fokker F-27, which would seem to fit the German bill both operationally

and financially. Built just across the border, the Dutch "DC-3 replacement" could be bought with guilders (one of the few foreign currencies which Germany can find relatively easily) and is basically an "Americanized" plane, an important factor in that the other units of the Lufthansa fleet will be American.

In addition to transport aircraft the German planners are interested in other types of planes, including rotorcraft, because it has been decided that a former Lufthansa aerial survey subsidiary, Hansa Luftbild, will be revived and will undertake pest control as well as survey and photographic work.

Overshadowing Lufthansa's entire equipment planning is the probability that Germany's own aircraft industry will be on its feet again and producing competitive transport aircraft before the present decade is ended. Lufthansa built up its excellent reputation with the use of German aircraft, and there is little doubt that it will turn to the home industry as soon as possible.

Although pre-war German airline operations are usually predominately associated with the three-engine Junkers JU 52 "workhorse of the air," Lufthansa was in fact well to the fore in sponsoring modern transport designs. The four-engine Focke Wulf FW 200, for instance, set the pace on European trunk routes in 1938 and 1939; at least one of these sleek planes is still in commercial service in South America.

Particular mention is made of the Focke Wulf company since it is the only pre-war German aircraft company still manufacturing airframes (under present regulations production is restricted to sail-planes). Moreover, Focke Wulf's chief designer, Kurt Tank, has been working on transport aircraft designs as well as jet fighters since he joined the staff of the Argentine state aircraft plant shortly after the war.

The presence in Latin America today of Focke Wulf's former chief designer and of Focke Wulf aircraft is no coincidence. Prior to the war, subsidiaries of Lufthansa operated in Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Peru, and Uruguay. Almost all the leading Latin American operators not connected with U. S. interests were directly or indirectly under Lufthansa's sway.

German aviation interests in South America, which had been growing steadily since the end of World War I, were greatly strengthened when Lufthansa started regular air mail service between Germany and South America early in 1934.

Lufthansa's operations over the South Atlantic were interesting in many respects. Extensive use was made of "mother ships" as bases for the sea-



GERMANY PIONEERED the North and South Atlantic routes with sea-planes and, given a suitable model, might well revert to flying boats for trans-oceanic operations. Illustrated above is the DORNIER DO 214, a long-range flying boat in the Hughes H-4 or Saunders-Roe Princess category. Work on the Do 214 was suspended in 1943.

planes which operated these flights. Instead of taking off from the sea, the flying boats were catapulted into the air from the "mother ships."

This brought about a considerable time saving in mail service between the United States and Europe and was so successful that a second German liner, the *Europa* (now operated by the French Line under the name of *Liberté*) was fitted with a catapult launching device. A total of 31 launchings were made from the two ships in 1931 and the flights were continued until 1935.

Atlantic Trail blazing

In 1936 two Dornier Do 18 flying boats powered by Junkers Jumo 205 diesel engines made four round trips over the route between Lisbon, the Azores, Bermuda, and New York, thereby trail blazing the first commercial trans-Atlantic operations. For the longer stages the seaplanes were catapulted into the air from one of the "mother ships."

Blohm & Voss Ha 139 flying boats displaced the Dorniers on the North Atlantic in 1937 and made 14 crossings between August and November of that year. Lufthansa was then all set to start a scheduled trans-Atlantic mail service but did not do so as it was not successful in obtaining U. S. permission.

In addition to spanning the Atlantic, Lufthansa flew other long-distance routes. There was a regular service to Kabul, Afghanistan, and in 1939 fortnightly flights were made to Bangkok with the ultimate purpose of linking Germany with China and Japan. Lufthansa had a healthy subsidiary in China known as Eurasia Aviation Corp., which in 1941 was taken over by the Chinese Nationalists and operated under the name of Central Air Transport Corp.

It was always the Lufthansa's hope

to establish a regular link with its Chinese subsidiary over the logical route from Germany to the Far East—across Russia—but permission for this was never granted by the Soviet government. Germany and Russia did actually get together in 1921 to form a joint airline called Derluft connecting Berlin and Moscow, and this company operated successfully until 1937 when, with the war clouds gathering, increasing hostility between the two governments resulted in operations being suspended.

In the war years most of Lufthansa's equipment, personnel, and shops were taken over by the Luftwaffe, although a small number of planes remained in civil markings to connect Germany with neutral countries and conquered nations.

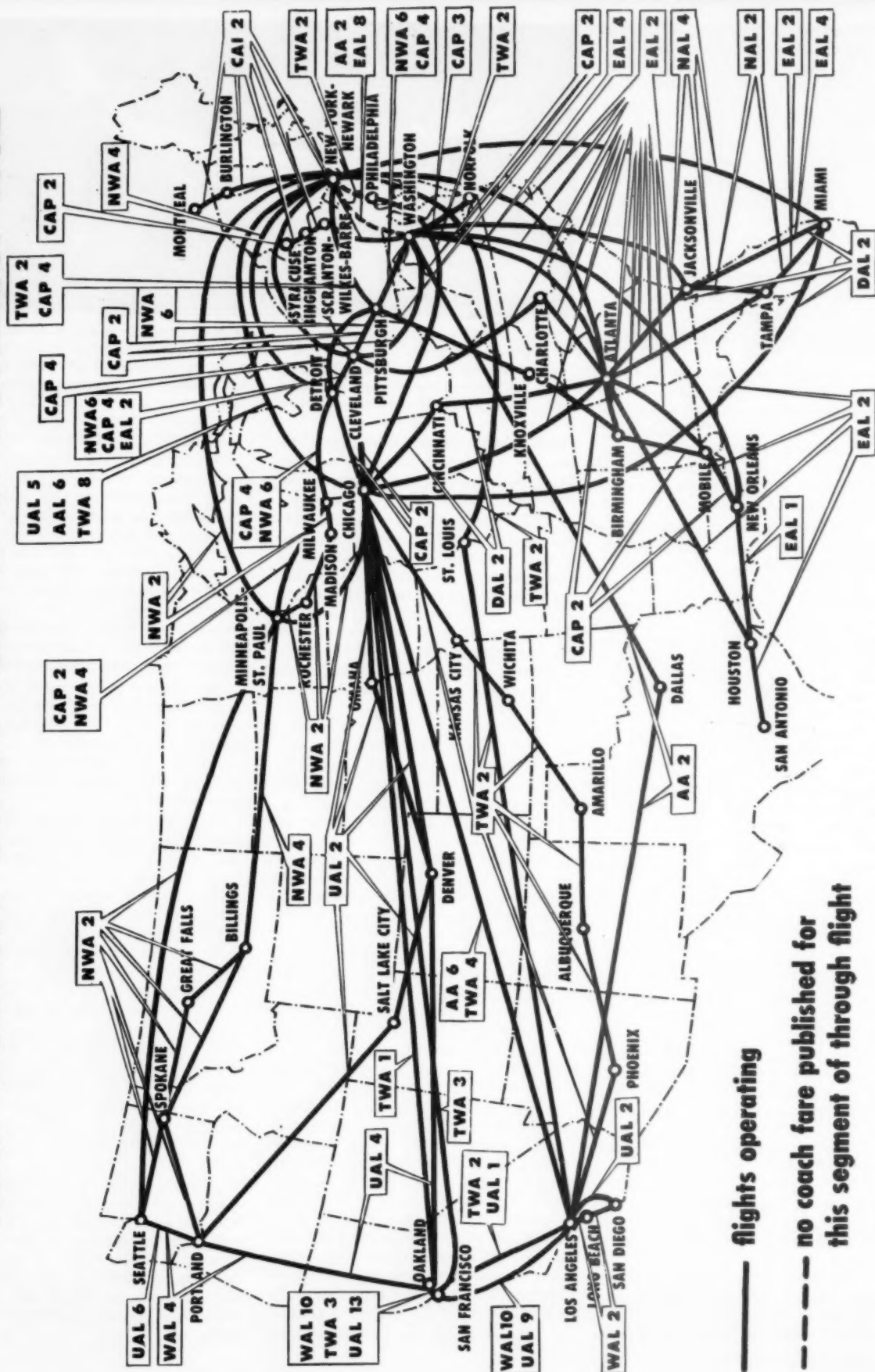
After the Hitler regime came to power, direct subsidies were paid on the basis of types and sizes of aircraft operated as well as on route mileage, whereas indirect subsidies included remission of airport landing fees. In return Lufthansa was required to carry up to 220 pounds of air mail on each flight without charge.

Any profit made by the company had to be turned over to the government, which owned two-thirds of the capital; the other third was in the hands of a company known as Deutsche Aero Lloyd which is still in existence (the planners of the new Lufthansa are particularly anxious to enable Deutsche Aero Lloyd stockholders to take up shares in the company).

The Lufthansa of the 'Fifties will operate under very different conditions from the Lufthansa of the 'Thirties. It will have the blessing of the government of a nation which is still one of the most air-minded in the world—but nothing more, no direct and indirect subsidies. This time Lufthansa will be flying solo.

• • •

AIR COACH SERVICE as of December 1952



flights operating

no coach fare published for this segment of through flight

Domestic Coach TRAFFIC and REVENUES

CARRIER	12 Mos. Thru Sept.	Rev. Plane Miles	Revenue Passen's	Rev. Pass.- Miles (000)	Available Seat-Mi. (000)	Passenger Revenue	Other Revenue
American	1952	5,704,788	206,183	337,969	383,178	\$14,196,959	\$ 376,321
	1951	2,685,163	91,933	160,079	182,299	7,148,141	218,334
Capital	1952	3,368,522	227,128	113,375	185,292	4,814,248	540,793
	1951	3,301,246	214,350	109,547	177,959	4,839,890	452,272
Delta	1952	1,646,918	72,783	63,459	87,827	2,697,346	106,622
	1951	1,296,023	54,942	46,130	67,479	2,091,265	55,632
Eastern	1952	7,863,340	425,040	364,651	516,795	15,903,533	470,565
	1951	6,934,778	358,813	301,366	423,701	14,415,443	312,832
National	1952	3,499,527	171,590	159,692	220,827	6,618,616	351,932
	1951	2,279,878	90,490	85,972	131,289	3,995,381	208,644
Northwest	1952	3,933,803	N.A.	172,499	230,574	8,299,627	282,881
	1951	2,882,827	N.A.	121,289	170,904	5,615,026	280,718
TWA	1952	8,545,554	323,935	495,109	595,560	20,544,819	349,247
	1951	3,919,842	168,020	219,605	273,651	9,963,515	262,681
United	1952	4,713,551	321,534	236,576	310,490	9,391,522	345,340
	1951	1,710,340	214,803	90,483	112,148	3,249,749	117,754
Western	1952	2,036,896	218,389	95,706	133,108	3,722,054	144,044
	1951	1,523,354	183,097	77,493	98,986	2,772,334	101,511
Totals	1952	41,312,899	1,966,582	2,039,007	2,663,651	86,190,724	2,967,655
	1951	26,533,451	1,376,448	1,211,964	1,623,201	53,411,481	1,999,922

N.A.—Not Available.

Coach Revenues to \$100 Million in '53

This year's figure of \$86 million makes them the carriers' second largest source of income.

By WILLIAM V. HENZEY

COACH services have become the second largest source of revenue for the domestic scheduled airline industry, exceeding the combined total of mail, cargo, and express intake and comprising over 13% of total passenger revenue.

A study of the most current coach statistics, those through September, 1952, indicates that revenue on the low-fare services of the 10 domestic lines offering such services climbed over \$32 million in a year to an all-time high of \$86.2 million.

With American and TWA proposing to double transcontinental coach capacity next spring and other operators planning expansion of services, a market of well over \$100 million can be looked for during 1953, barring economic adversity or a revised government policy.

Key to the increase for the 12-month period through September was additional services by the airlines, expanded use of the services by the public, and continuation of the general surge of American business. An off-setting factor to some extent was a reduction in coach fares earlier in the year which deflated total revenues but which, according to

some theorists, inflated the number of users.

Substantial gains in all statistical categories predominated.

• **Trans World Airlines**, second in 1951 in the coach field, more than doubled its annual coach revenues with over \$20 million and moved into the top spot among industry carriers in this department.

• **Eastern Air Lines**, replaced as the leader, was second with a \$15 million gain and a total of close to \$16 million. Counting its San Juan coach operation too, Eastern's total was closer to \$19 million.

• **American Airlines**, which added new intermediate points to its transcontinental coach schedules, also doubled its revenue for a third-ranking spot with over \$14 million.

• **United Air Lines**, which almost tripled its revenue figure for the comparable 1951 period, is fourth, followed by Northwest, National, Capital, Western, and Delta. Recently Colonial Airlines became the 10th scheduled line to enter the field.

As for penetration of the over-all market, Eastern continued in the lead with 425,000 passengers carried on

domestic coach flights. TWA is next with 323,935, and United close behind with 321,534.

For example, the \$86 million total coach revenue is \$23 million more than the total mail pay estimated by CAB not only for the domestic trunk-line industry but the local service industry as well for fiscal 1953. It is \$22 million more than mail pay estimated for all U. S. international carriers for the same period. And all nine coach lines are on subsidy-free mail rates.

Although the coach revenues are 13% of industry total passenger revenue and 15% of passenger revenue of the nine early operators, the \$32 million coach gain is 33% of the \$91 million gain in total passenger revenues by the nine lines for the year ended September, 1952, over the comparable period of a year ago. These same coach lines average 90% of total industry passengers.

Add 560 Seats

Next year, in its transcontinental coach service, American plans to expand its seating in DC-6's from 70 to 80 seats, increase total daily flights from four to seven, and thereby increase total daily capacity each way to 560 seats.

Similarly, TWA will increase its daily 81-passenger Constellation service from four to eight flights, and its daily seating on this type aircraft from 324 to 648 seats in each direction. In addition, TWA contemplates a DC-4 transcontinental flight daily with 70 seats each way.

Thus, these two carriers in the transcontinental field will make available daily a total of 1,278 coach seats each way. On an 80% load factor at the prevailing \$99 fare, American and TWA would realize approximately \$62.5 million annually from these flights alone.

If United should enter this market with DC-6 equipment, as indicated by its officials at hearings in CAB's Large Irregular Air Carrier Investigation two months ago, the transcontinental market conceivably could be productive of revenues equal to the \$86 million total registered by all nine lines in all coach markets for the year ended last September.

This fits in with certain airline and CAB theories that expansion of scheduled coach services to additional points throughout the country will be facilitated by the progress in the lush transcontinental market.

It is not generally anticipated that coach service to all points will pay its own way. But with a cushion from the transcontinental market or the Chicago-New York, New York-Miami, or Chicago-Miami markets, additional services can possibly be provided without overall loss to the carriers.

News Briefs



First supersonic flight of the Republic XF-91 experimental interceptor has been completed at Edwards AFB, Calif., using a 6,000-pound-thrust Reaction Motors rocket engine for auxiliary power. The inverse-taper-wing airplane uses a 5,200-pound-thrust General Electric J47 engine and afterburner for subsonic test flights.

PEOPLE

Germany has expressed its gratitude to Pan American's **Juan T. Trippe** by awarding him the **Order of Merit** for his help in getting Germany back on its economic feet and for PAA's part in the Berlin Airlift.

"Aviation Man of the Year," as far as the University of Denver is concerned, is **T. E. Braniff**, president of Braniff Airways.

Arthur G. Woodley, president of Pacific Northern Airlines, is not impressed by the Air Force's creation of a survey group to investigate **Alaskan air facilities** and crews as a result of a string of recent crashes. Woodley, whose line has flown 21 years in Alaska without a passenger accident, scornfully described the USAF plan as "a cheap attempt to white-wash its own deficiencies."

CAB member **Chan Gurney**, whose term on the Board expires December 31, is off on a month's vacation, leaving Republican **Ryan** and Democrats **Lee** and **Adams** to hold the fort for the remainder of the year.

John E. Bierwirth, president of National Distillers' Products Corporation, has been elected to the **TWA board of directors**, filling the vacancy created by

the death last July of **Nelson S. Talbott**.

President of the **National Aviation Trades Association** for 1953 will be **Harland S. Herrin**, of the Morrison Flying Service, Helena, Montana.

Sir Frank Whittle, British jet pioneer, has arrived in the United States to study the operations of the **Shell Oil Company**, with which he is now associated.

Charges of grand theft have been lodged against the president of **Oakland Aircraft Engine Service, Inc.**, **William G. McDowell**. Out on \$9,000 bail, McDowell is awaiting arraignment on charges involving parts and equipment of his firm as a result of a complaint signed by **Orvis M. Nelson**, president of **Transocean Air Lines**, of which the engine overhaul company is a subsidiary.

New manager of the air transport division of the **Flight Safety Foundation** is **William P. Person**, former captain and instructor of copilots for **American Airlines**.

D. W. Harris, vp-industrial relations for **TWA**, has been elected chairman of the board of **Airline Personnel Relations Conference** for 1953. He succeeds **John G. Deater**, director of personnel, **American Airlines**.

MILITARY

First production model of the **F-84F** has been turned over to the **USAF** by **Republic Aviation Corp.** The "F" is a swept-wing version of the **Thunderjet**.

Engine tests on the **Boeing-built XB-52** have brought the plane to **Edwards Air Force Base, California**. Most of the test program is being conducted at **Boeing Field, Seattle**.

One of the two **XF4D** prototypes is being reworked by the **Douglas Aircraft Co.** in preparation for **carrier suitability tests**. The other one remains at **Edwards Air Force Base** for company tests.

Funds for a **third carrier** of the **Forrestal class** (59,900 tons) have been approved by **Defense Secretary Lovett** for the fiscal 1954 budget.

FINANCIAL

An **extra dividend** has been voted at **Lockheed** on the earnings for the first nine months and on forecasts for 1952 and '53. Dividend will be 10 cents payable in stock on the basis of one share for each 10 shares held, as of December 23. Estimate is that nine-month net earnings will total \$4.75 million.

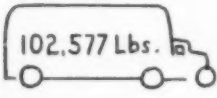
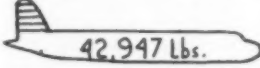
For its common stockholders, **Bell Aircraft Corp.** has declared a **dividend of \$1 per share**. Some 879,000 shares are outstanding.

Pratt & Whitney Aircraft Division has received **new contracts** to the tune of more than \$23 million, mostly for engine parts.

Solar Aircraft, with a backlog of over \$92 million already, has racked up **record sales** during the six months ended October 31: **\$32.8 million**, as compared with a mere \$23 million for the same period in 1951.

Record revenues were the word at **Northwest Airlines**, too, in October. **Operating revenues** hit \$5.17 million, bringing a profit before taxes of \$623 thousand. Comparable revenues in '51 were \$4.5 million.

The Economics of Air Freight

TARE WEIGHT	CRATING CHARGE	TRANS. CHARGE	TOTAL
 102,577 Lbs.	\$ 37,528.71	+ \$ 6,523.79	= \$ 44,052.50
 42,947 Lbs.	\$ 8,468.13	+ \$ 5,583.11	= \$ 14,051.24
Savings via Slick Airfreight			\$30,001.26

What Air Freight Needs for Growth

Cargo airplane, terminal facilities, and government action needed for continued expansion.

By JOSEPH S. MURPHY

THE GREAT potential for growth in the air freight industry is widely accepted. The Lockheed Aircraft Corporation recently predicted a possible one billion ton-mile business as early as 1958 in domestic operations alone (AMERICAN AVIATION, November 27).

But of similar wide acceptance is the realization that there are major problems to be solved if this growth is to be achieved. With this single purpose in mind, early this month industry experts participating in the Fourth Annual Air Cargo Day activities sponsored by the American Society of Mechanical Engineers outlined these needs:

- A true air freight airplane with a direct operating cost of not more than three or four cents a ton-mile . . . closer cooperation between the air freight industry and the military through a proposed Airfreight Advisory Committee in the USAF could lead to its development.

- An air freight terminal design that will speed up materials handling and reduce ground handling costs . . . airport managements cannot plan future cargo facilities until industry decides what it will be.

- Government action in support of international air freight . . . an application filed in July, 1947, for certification to fly trans-Atlantic all-freight service is still before the Civil Aeronautics Board.

Slick Airlines' President Thomas L. Grace presented the case for the true air freight airplane, and warned that commercial air freight will not grow into the billion ton-mile a year

class by operating modified passenger aircraft.

The true air freight airplane must offer these general features:

- Direct operating cost of not more than three to four cents per ton-mile.

- Allowance for large scale, mechanized loading and unloading.

- Sufficient volume and useable hull area to permit carriage of varied articles of high and low density.

- Simple and rugged construction for low cost and easy maintenance.

- Three-man crew operation.

- Ability to trade fuel for payload.

But aircraft manufacturers are not willing to invest the \$15 to \$25 million to develop such an airplane, at least not as long as they are dependent solely on the present market which commercial air freight affords, hence the Grace plea for industry cooperation with the military. Here the Slick president sees the consideration of "commercial usefulness" in the design of military cargo transports and proposes creation of an Airfreight Advisory Committee in the USAF or military services generally to insure this consideration.

Basic aircraft structure now designed to meet purely military high-



Grace



Brell

unit-weight loads could be replaced with secondary structure to accommodate these high loads, but of removable design which would not penalize commercial operators. The cargo hold, by reason of average cargo densities, is of lesser volume for a given military payload than for an equal commercial payload. By lengthening the fuselage a few extra feet, the increased commercial usefulness of the aircraft would far outweigh the resultant decrease in military performance.

On the industry's accomplishments Grace offers these significant notes:

- The air freight industry which in 1946 carried approximately 40 million ton-miles of air freight, and which saw a 425% increase in volume, carrying almost 210 million ton-miles in 1951, will probably reach the 250 million ton-mile mark in 1952.

- The independent air freight fleet, now composed of 93 aircraft with a potential airlift capacity of 750 tons, or 1,133,000 ton-miles per eight-hour day, will, upon delivery of Douglas DC-6A and Lockheed 1049B aircraft by 1954, grow to 1,000 ton payload, or 1,650,000 ton-mile capacity per eight-hour day.

Cheaper than Rail

- Slick Airways, operating at almost 100% load factor for a two and a half year period, supplied the Navy with 10 transcontinental round trips a week carrying high priority cargo at a cost of 11 cents a ton-mile, comparing favorably with first class trucking rates, and two cents cheaper than rail express.

- Concentration on reduction of tare weight has paid dividends. Slick's packaging engineers demonstrated reduced transportation costs through reduction of tare weight. Slick shipped 67 bomber turrets by air freight from St. Louis to California at a cost approximately \$30,000 below that of surface transportation.

Supporting the Grace position on the need for a true air freight airplane, Seaboard & Western Airlines' vice-president operations, Carl Brell, outlined these desired features for a trans-Atlantic airfreighter:

- Payload carrying capability of 75,000 pounds on the critical leg of the North Atlantic;

- Cruising speed of approximately 300 miles per hour;

- Direct operating cost of not more than four cents a ton-mile.

Citing current unofficial east- and west-bound trans-Atlantic freight records for Douglas DC-4 aircraft as both in excess of 16,000 pounds, Brell views

What MATS Wants in Jet Transports

First announcement by the military of specific action on a U. S. jet transport highlighted Air Cargo Day activities early this month, when Lt. Gen. Joseph Smith, MATS commanding general, told of "system study contracts" let last Spring to Lockheed, Boeing, and Convair, upon which future USAF action will be based. MATS recommended these general characteristics for a military jet transport:

Normal payload	25-30,000 pounds
Normal range with above payload	2,200 naut. miles
Normal cruising speed	550 knots
Take-off distance over 50 foot obstacle	6,000 feet
Landing over 50 foot obstacle, brakes only	6,000 feet
Cargo compartment dimensions:	
length	40 feet
width	10 feet
height	9 feet
cargo floor height above ground	45"

the true arrival of trans-Atlantic air freight with larger airplanes that are economical enough to provide shippers with a tariff low enough to generate a constant flow of billions of pounds. The use of Super Constellations (Seaboard & Western has four on order for delivery in 1954) will permit a broadening of the tariff, and is a step in the right direction, according to Brell.

But mere comparison of rates does not tell the whole story in international air freight operation. Air insurance rates for an all-freight carrier operating across the North Atlantic are 15¢ per \$100 evaluation, compared with 50¢ to \$1.00 per \$100 for surface shipping. The speed of air delivery in contrast to shipping brings savings in inventory, warehousing, and capital requirements.

Furthermore, the unbalance between east- and west-bound traffic is gone. In 1948 Seaboard & Western flew 2,300,000 ton-miles of commercial export freight from the U. S. to Europe and the Middle East, bringing only 794,000 ton-miles to the U. S. from those areas, a differential of 190% in directional flow. In 1951, the variation between import and export traffic was only 3%.

To Brell the international trade areas provide the greatest potential for the development of air freight, but the government must provide early and sufficient authority for the all-freight carrier to further this development. Seaboard & Western filed application in July, 1947, for certification to fly trans-Atlantic all-freight service; the case is still before the CAB.

Seeing a growth of domestic air cargo to an estimated 850,000 ton annual volume by 1960 as forecast following a recent Civil Aeronautics Administration study, CAA airport engineering chief Philip Hahn warned that until the industry settles on the "hows" of air

freight terminal operation, airport management will be unable to plan the needed cargo facilities.

Hahn stressed the effect that reduction in loading and unloading times have on this planning. Assuming that a typical four-engine, all-cargo aircraft can be loaded in about two hours and that the cargo potential at a particular point would call for twenty plane loads, (during the 9 p.m.-1 a.m. peak period) the need for 10 loading positions is demonstrated. At a cost of approximately \$100,000 per position, which would include apron, building, and truck court, the basic terminal facility investment becomes one million dollars.

Cut Loading Time

If loading time could be reduced 50% through improved techniques and equipment for handling cargo, the facilities investment could be similarly reduced.

Prolonged loading and unloading times profoundly affect the cost of operations. Using statistics from a study made by an airport consulting engineer some time ago, Hahn cited typical New York-to-Detroit air freight operation ground handling and only 15% time for materials shipped represented ground-handling and only 15% time in the air. Similar study of New York-to-Los Angeles operations revealed that 67% of the total transit time was spent on the ground.

Operators of passenger-cargo combination aircraft as well as all-cargo aircraft have these specific requirements for a freight terminal, according to American Airlines' Frank W. Jones, director of cargo service:

- **Shape**—Rectangular;
- **Dimensions**—Minimum 50' wide and 18' ceiling;
- **Floor height**—Ground level (with truck well on one side);

- **Aircraft parking**—One location for each 7,000 sq. ft. of warehouse space;
- **Location**—Close to passenger terminal and hangar areas;
- **Other Features**—Good lighting and ventilation, heating and refrigeration facilities; office space provisions up to 15-20% of warehouse space.
- **Needs**—Improved methods of loading and unloading all-cargo aircraft and better mechanical methods for processing freight.

Seeing advantage to all cargo carriers in being housed in the same freight terminal, Jones explained the quick and easy transfer of freight between carriers that such an arrangement would permit, along with the simplified pick-up and delivery means it would provide shippers and draymen by centralizing their business at one point on the airport.

In support of the ground level terminal floor, it was explained that substantial quantities of cargo will always be carried in passenger equipment and the terminal design must be flexible enough to permit its movement to these type aircraft, a task now most efficiently accomplished by tractor-trailer trains.

Presenting the aircraft manufacturer's views on terminal design, Douglas Aircraft Company's H. O. Olson projects a cargo terminal, loading docks, and materials handling equipment that should permit on/off loading at the rate of 1,000 pounds per minute. Reviewing the nature of cargo, Olson presented this tabulation of package weights, sampled from a three month MATS operation:

Less than 100 pounds ...	67%
100 to 300 pounds	27%
300 to 1,000 pounds	4%
1,000 to 3,000 pounds ...	0.7%
Over 3,000 pounds	0.5%

In contrast with the rectangular terminal proposed by AA's Frank Jones, the MATS terminal is pictured as semi-circular in shape, according to Gen. Smith, with these operational features:

- **A self-sufficient terminal** with all related functions under one roof.
- **Ready accessibility** to both trucks and rail cars.
- **Straight-line movement** from receiving area to aircraft.
- **Maximum aircraft loading positions** by having the maximum possible periphery consistent with efficient layout.
- **Ease of aircraft positioning** due to terminal contour.

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DECEMBER 22, 1952

with

William Littlewood

Vice President

Engineering

American Airlines

Trends in Air Transport Equipment

William Littlewood, vice president-engineering of American Airlines, was selected to deliver the Sixteenth Wright Brothers Lecture December 17 on technical trends in air transport. Internationally recognized as an outstanding aeronautical authority, he has been with American for 25 years, having served as general manager of Fairchild Engine Company, predecessor company of AA.

Littlewood was born in New York City in 1898 and studied at Cornell University, where he was the recipient of the Sibley Prize, awarded for the highest rating in engineering studies for two consecutive years. For seven years after graduating in 1920 he was in the machine tool and heavy machinery manufacturing industry.

He entered the aviation industry in 1927 when he joined Fairchild. He joined American Airways in 1930, becoming chief engineer three years later. He was elected vice president-engineering of American Airlines, Inc., in 1937.

Littlewood has received wide acclaim for his contributions to the development of such aircraft as the Douglas DC-3, DC-4, DC-6, and the Convair 240. Among the honors he has received is the famous Wright Brothers award for his "outstanding contribution to aviation" in 1935. A British aviation publication once characterized him as "perhaps most famous of all airline engineers."

Q. There appears to be a trend to aircraft carrying approximately 100 passengers. How big do you see the industry requirements as forcing aircraft capacity?

A. I think the growth trend in large aircraft size, which in the past has shown an amazingly consistent curve, will be projected to a size of 100 to 120 passengers in the next eight-10 years. There is, of course, a smaller group of airplanes which do not follow this large-size passenger growth curve. The smaller ones will probably increase proportionately too. While we see them as 40-50 passenger planes today, we will probably talk about them as 60-70 passenger planes 10 years from now. And there may well be a third and smaller group of transports.

Q. Eastern is now advertising that it operates 35 flights a day between Washington and New York. This frequency seems to be dictated purely by carrying capacity. Do you think these short-haul routes will ultimately use high-capacity aircraft?

A. As schedule saturation is approached the only way to grow is by the use of larger aircraft. We have come pretty close to schedule saturation with 35 or more trips per day by one airline on one route. I would say there is a distinct need and inevitable trend toward larger unit capacities. This will bring the bigger units into local services, assuming their performance characteristics will be consistent with the needs.

Q. What do you see as the biggest area for improvement on airline safety?

A. I think the biggest single improvement in airline safety will come from the provision and utilization of more accurate and complete weather information, and technical advances in the approach and landing regimes. Important steps include the provision of terrain collision prevention and weather probing equipment such as airborne radar; the interim development of high intensity-flashing lights for airplane collision prevention; and the ultimate development, perhaps on the Doppler principle, of high speed collision prevention devices.

The substantial reduction, and we hope the eventual elimination, of all fire hazard, will be a tremendous step forward. That I am sure can be accomplished. We have made rapid strides in detection systems and the determination of adequacies of fire extinguishing equipment and installations.

Another major safety step will be the provision of crash tolerance ability in aircraft sturdiness and detail design. We can make airplanes superior to any other vehicle in that respect.

Q. Does American feel as strongly about the need for low wing designs for cargo aircraft as it does in passenger aircraft design?

A. The decision there should be based more on economic considerations. The most obvious argument is the ease of loading with the lower floor height. This is not too real if you have a satisfactory terminal installation. I do not feel there are too legitimate objections to high level loading except those imposed by poor loading equipment and poor terminal design.

Q. What is your viewpoint on the potential of turbo-prop transports in the airline picture?

A. I am quite convinced that in the shorter ranges the favorable characteristics of the turboprop, geared to the airport problem much more than to speed, indicates that it is the logical eventual answer for such aircraft. In the very

"Jets... must have superior economic factors"

long ranges where fuel consumption becomes the most critical factor, and you run out of weight, the turboprop with its much better fuel economy again becomes the more appealing type. But there seems to be a bracket of ranges, between those two limits, in which the turbojet will do a very economical and efficient high performance job.

Q. Do you look on conversion of Convair 340's to turboprop power as a practical project?

A. I doubt whether it will prove sensible. The economics are very debatable. The compromises necessary to achieve the objective do not seem worthwhile. If you are to spend as much money as you will have to for the performance and advantages of a good turboprop you might better spend the extra capital necessary to get a really good one, and not take a compromise job with built-in extra operating costs.

Q. What kind of a cost would you relegate to a turboprop engine conversion job on a plane of DC-6 size?

A. I would roughly guess $\frac{1}{2}$ to $\frac{3}{4}$ million dollars for conversion, and that may be low. If you take the bare cost of power plants and then consider all the costs of conversion and installation plus the compromises that you will have to accept in such an airplane, they seem to outweigh the potential benefits. I doubt whether any conventional aircraft will ever be converted to turboprop or jet operation on a sound basis.

Stretched Fuselages

Q. What do you see as the most significant development in the aircraft itself, excluding power plants, during the past few years?

A. I would say that during the past few years the most significant development has been the application of bigger powers and the accommodation of larger capacities to release the ultimate economic potential of the Constellations and DC-6's. The Constellation has increased in fuselage length a total of 18 feet, the DC-6 has increased its fuselage length, taking in the DC-7, a total of 10 feet. Both of these enlargements have provided tremendous economic value in increased capacity. As long as you can maintain and improve the performance qualities by increased power, as we have been able to do, the net results are individual aircraft which have much greater earning capacity than they did, and at small increase in cost.

Q. What do you see as the major problem facing the airlines so far as equipment goes in the next five to 10 years?

A. The major problem is going to be the decision as to whether or not we can afford to continue to operate the present types of aircraft. I am sure the answer will be "yes." We will be very happy and content to operate, as a very large percentage of our total operation at least, aircraft of the presently available advanced types—the Constellations, DC-6's and 7's, Martin and Convair airplanes.

Toward the end of the period I think a number of us will be looking to the early introduction of some new aircraft of the jet type along with the refinement, for the leading services, of the DC-6's and Constellations. We will also be laying active plans for the eventual successors to our smaller transports.

Q. American and United have apparently worked so closely with Douglas that their choice of a jet transport appears to be a foregone conclusion. Is this a fair assumption?

A. We are not in full agreement with any manufac-

turer with respect to the specifications and economic factors of jet transports and we are entertaining at this very time continued and detailed studies from all who are interested. The only manufacturer who has announced that he will proceed without benefit of consulting his potential customers is Boeing. We have advised Boeing of some of our thoughts and desires on the subject but have not been apprised of their reactions or intentions.

Q. What do you see as the five most important characteristics which a jet transport must meet?

A. (1) In the first place it must show no backward step whatsoever in safety; it is hoped that it will show a substantial improvement, but we must recognize that increased speeds bring into the picture some increased risk and, therefore, our first objective is to hold the line and work for better. That is a fundamental requirement.

(2) It can't be an airplane that will only do one specialized job. It must perform efficiently from some minimum range to some maximum range. The maximum range which we would hope for would be transcontinental non-stop operation; the minimum range hoped for would be 500 miles. If it is impossible to straddle those two objectives we would not necessarily be too disappointed but we are striving for some such ideal.

(3) It must have superior economic operating factors of all kinds—good reliability and economy of power plant operation, low specific fuel consumptions, and low maintenance costs throughout.

(4) It must have high performance in order to merit the investment and have the passenger appeal which will bring in the load factors which we will have to have.

(5) It must cost a not too exorbitant price, although frankly I mention that last because it is absorbed within estimated operating costs. While capital requirements may be a serious problem for some airlines, if we can prove the economic benefits to be achieved the capital requirement is usually forthcoming.

Q. What would you consider a low specific fuel consumption for a commercial turbojet?

A. We are hoping to achieve operationally .8 pounds sea level specific fuel consumption on jets. We know it can be done on the test stand; we hope by the time we get them in operation it may be a realistic operating value.

Q. What do you personally project as the cost of a commercial jet transport?

A. In our studies to date, we have left it to the manufacturers to project the costs, because the first cost becomes an amortized part of the operating costs and what we are interested in is "what is the net operating cost against the potential revenue?" Even so, I feel that the jet transport costs that the manufacturers are mentioning today are entirely unrealistic. They are apparently based on a philosophy of demanding full protection against any and all risks of the undertaking. They started out talking about \$2 million to \$3 million a unit for the type of airplane we mentioned—long range domestic jet transports. It grew to \$3½ to \$4 to \$4½ million, and I have seen some mention of \$5 million.

Those figures, in my opinion, have no basis. They are figures which the manufacturers are pulling out of the air, perhaps to scare us out if we don't mean business, but in any event to guarantee that they are taking no risk whatsoever in the development. I think we will finally compromise on some kind of a realistic figure somewhere between those two limits.

1967 design accent-safety, then economy, then comfort

Q. You mentioned operating costs. Does a new jet transport type necessarily have to be more economical than the airplane it succeeds?

A. My philosophy is this: In providing much faster transportation, with equal or better safety, and more comfort, convenience and dependability, we will be giving to the public a real value—a value far beyond anything that we are able to give now. Therefore, if for that greatly improved service we have to ask some slightly higher increment of cost than what we ask now, it would appear to be thoroughly justifiable. I personally am unable to understand the philosophy which insists that the airlines must continue to give more and more for less and less.

Q. In the past six months airline engineers have been laying down the law and have put a new jet transport concept before the manufacturers. Would you comment on this?

A. We have long been studying and crystalizing our own thinking on the subject of jet transports, and we are greatly impressed with the desirability of achieving maximum economy. We are working and studying to reduce the cost per unit of transportation. We wished to examine this field because the manufacturers in their earlier studies had not explored much except to make a straight application of military jet developments and put them into transport form. We have asked them to take the variables—size, performance, range, powers, and all the rest and see if they can find out what combinations of those factors will produce a satisfactory increase in performance with a minimum cost—not first cost—but operating economy.

Q. Is it true that AA, United, and a few of the big operators have decided that the cruising speed will probably come out around 480? In other words, it won't be above the 500 mark?

A. We have decided that anything under 500 cruising becomes questionably desirable because of the minimum necessary increase over the 365 mph of the DC-7. However, to go much higher than 560 or 570 mph cruise it would be necessary to approach too close to high speed Mach 1 for comfort. You would go below 500 only if the advantages of economy were so outstanding that you could not deny them.

Q. What are your requirements as to future stretch in a jet transport?

A. One of our essential requirements in our conversations with the manufacturer has been a "plan of growth" to utilize the powers or thrusts which will logically become available in the future. We are trying to look forward 15 years in that respect. Drag-rise limitations will set the maximum speed available and ranges are generally fixed by operational requirements. This leaves only increases of capacity to effectively utilize the higher thrusts to be available.

You might start, with the limited thrusts available, at a somewhat lower maximum speed condition than your design would permit you to go to. Then you would first go to that and later use the increases in capacity. As in the past, the probable increases will be by elongation of the fuselage. So we will definitely require the building in of provisions for elongation of fuselages consistent with projected thrusts available in the future.

Q. Assuming the sonic barrier will, economically or otherwise, limit top transport speeds for the next 15 years, in what direction do you feel transport designs of this period will improve?

A. In comfort, economy and safety—and, I hope, in reverse order!

Q. How does American look on such items as kerosene type fuels?

A. In the future we will use them with jet engines because of their availability and low cost. Unfortunately, in the presence of hot parts, they are not particularly safer than gasolines.

Q. How about parachutes for emergencies?

A. We are willing to consider parachutes for deceleration on jet landing, strictly as an emergency device for slippery runways or off-airport landings, but we feel that there must be developed, and will be developed, a reverse thrust device for jets. Required deceleration can also be provided by many other means.

Manufacturers Must Act

Q. What about the matter of protection against explosive decompression?

A. I feel very strongly about that. We have neglected the requirement for tear resistance in the skin structure of pressurized compartments. We have had some impressive demonstrations in the past as to just how significant this thing can be. We have seen the tear vulnerability due to minor penetration of the pressurized fuselage. Manufacturers must regard that problem seriously and do something.

In my opinion there is nothing fallacious about the philosophy that the whole structure of the fuselage, including its windows and doors, and their sealing and retention, must be considered as guaranteed against pressure failure at the highest altitude it is proposed to operate to the same degree as any major element of the airplane is insured against structural failure. We would not fly an airplane in which we thought there could be a spar failure under any normal loading or minor incident.

Q. What about the fuel reserve standards?

A. A realistic approach to the question of fuel reserves is even more essential with jet operations than it is with conventional aircraft. Actual operational reserves are normally computed on a much more liberal basis than regulations require. Our discussion with the manufacturers on jets have specified an approach at 20,000 feet and a weather held maneuvering time of 45 minutes, then a descent to look at the airport, a climb out and cruise to an alternate airport 300 miles away, then a second 45 minute hold and final approach and landing. We also allow 5% above manufacturers' guaranteed fuel consumption for estimating.

Q. Is the ATA jet specification, issued only recently, obsolete at this time?

A. No, I don't think so. I think there is a lot of good thinking in it. In fact I was surprised and pleased that ATA succeeded in putting together so many diversified points of view and coming out with anything even resembling a document. American went to work on jet transports with United, not to contradict the work that ATA was doing, but to supplement it. We both continued to work with ATA.

The ATA spec calls attention to a lot of things that more people in the design field should be thinking about. In that way it does good in clearing up and stimulating thought. Maybe we will end up with many more jet features than we would have otherwise.

Q. Do you feel that the ATA formula for figuring operating costs is realistic as applied to jet transports?

A. It is basically a good formula but it has been

"We would not . . . entertain consideration of Comets"

modified by both Lockheed and Douglas, and we are in general agreement with their modifications, mostly in the areas of engine-overhaul and operating costs, maintenance costs, first costs, and depreciation provisions. But, as modified, we think it represents a pretty realistic approach, particularly for comparative purposes. We are urging that industry consideration be given to an early revamping of the whole formula based on more modern concepts.

Q. Would you comment on this business of engine locations, whether they should be in pods, or built into the wings, or buried in the fuselage?

A. At the moment we have no firm conclusion in the matter but recognize the apparent performance and control advantages of the buried installation in the fuselage. The problem there, of course, is demonstrating beyond the shadow of a doubt that you have as good or better safety, and as good efficiency with respect to ram recovery and maintenance accessibility. We do not think we would entertain installations within the basic structure of the wing, such as in the Comet. Other than that I would say we have no firm conclusions.

Q. Safety-wise, what is the major factor governing engine operation?

A. We are seriously concerned about such potentially catastrophic events as turbine wheel failures, which even though they may occur only every 200,000 hours, nevertheless would be much too often. We would like to know what the effects of such a failure would be, and how to guarantee that they can be avoided. There is, of course, some risk in such a failure even in a pod engine installation, but there is possibly more risk in buried installations because of the involvement of other power units as well as fuselage installations. Fire is perhaps the most common power plant safety problem. Prevention and control seem very possible.

Q. Do you feel that Pan American's choice of the Comet I will be expanded, and do you feel that their influence will cause other operators to turn to the Comet?

A. I don't think the action of PAA will have any influence on the actions of domestic operators; it might have some influence on the actions of competitive operators in the international field. But certainly it is of little concern to us and we would not be willing at this time to entertain consideration of Comets as now proposed.

Q. Will the high cost of jet transports force airline operators to accept a greater degree of standardization in such matters as cockpits, controls, interior layouts, etc., in order to keep overall prices down?

A. Yes, and in order to promote efficiency, economy, and safety in operations. There is a strong trend toward reasonable standardization. After long years of effort it has become quite a real thing. SAE has been extremely successful in bringing together conflicting views on instruments and their location.

A standard is not an inflexible thing. I always define a standard as "an agreed good way of doing a thing at a given time," and that is about all it is. I would like to see much more standardization throughout the aircraft, particularly with respect to all emergency equipment and operations, including doors and emergency exit locations, sizes, shapes, handles, and all the rest. I do not expect to see too much standardization in cabin interiors or arrangements, however. As in the past, personal tastes will prevail.

Q. Manufacturers seem to feel there is a market for

only one type of jet transport in this country and that if two manufacturers build a prototype, one of them is dumping 20 to 30 million dollars down the drain. Is there a market for more than one type of jet transport at this time?

A. Unless a manufacturer can determine the existence of a substantial foreign market, there does not seem to be enough business to justify the development and production of more than one jet transport of the kind that we are talking about. You would certainly want to be able to sell at least 100 such units to justify the whole program. If you do that you are pretty well through. There probably won't be 200 of them sold in this country.

I do think that there is a market for three airplanes in this picture. Eventually there will be a market for a job to replace the 240's, 340's and 4-0-4's, probably of the turbo-prop type, meeting a market among the larger airlines and with some of the airlines that are growing up to need that kind of equipment. There will also be a market for the jet medium to long range domestic transport that we have talked about, and there may very well be a market for a third long-range overseas aircraft, possibly a turboprop type of aircraft of bigger size than the domestic jet transport.

Split Projects Up

If each manufacturer could analyze his own best field of effort and they could split the projects up among the several we could have three good projects coming along. I don't think that the market or the program can justify the development of two prototypes for any one particular use. I wish it could, because we would get better airplanes.

We would like to have two jet transport developments for this medium to long-range domestic use. But I don't think we can afford to, so we will have to do our thinking in advance. That is why the airlines are not going to sign any contracts until they are very sure they are going to get something that will come very close to what is required.

Q. How many aircraft types can a big operator, such as American, use economically?

A. If we determine that we can meet our overall needs with two models of airplanes, we want to do so. We don't want more unless we have to. We may finally decide that it takes a jet, plus a large piston type or turboprop aircraft, plus a smaller conventional or turboprop aircraft to do the overall job. We don't know that yet.

We are trying to work out a jet that covers as much of the bracket of our range requirements as we can without sacrifice of inherent economy. There is always a minimum useful range and there is always a maximum useful range for each airplane, above and below which it is not much good. Unfortunately, this will be even a little more so in jets.

Q. In computing jet transport operation costs, what engine overhaul period are the airlines resigned to during the early years of operation?

A. We don't know, but I would anticipate an initial 500-hour overhaul period would be probable. The extension of overhaul times, I think, will follow the same general type of curve as the extension of piston engine overhaul times.

I have some interesting plots on that subject. In 1927 our overhaul times were frequently about 100 hours. It has been a long up-hill pull. I think that our jets will start somewhere down on the flat at the bottom of a similar curve, but at a somewhat higher value, probably 500 hours by the time we put them in use. Its extension, from then

"Jet runways . . . nothing . . . more than 7,000 feet"

on, I believe, will be on a very parallel line to the history of piston engine overhaul time.

Q. Do you feel you are going to have to plan on operating out of the present airports?

A. The jet airplane will make very little difference in our airport problems. We are going to have to have about the same approach speeds and landing speeds and consequently about the same wing loadings. We can hope for better high lift devices and developments in that area.

We have determined that the airports on the Atlantic coast and the main airports on the Pacific coast and a string of airports in the middle of the country which are associated with large cities like Chicago, St. Louis, Ft. Worth, Dallas, etc., will be adequate for any contemplated jet operation. There is a vast area between those places, but they will not need jet operation in its initial concept. We cannot key our airplanes to the limited airport capacities of substandard cities and hope to have anything that will realize the economic benefits of high speed, long-range operations.

Q. Are you thinking of six or eight thousand feet?

A. Nothing that will take more than 7,000 feet, and for shorter ranges, much less. Our problem is landing, not take-off, and that problem may be satisfactorily solved soon.

Local Service Problems

Q. Have you given the local service airline transport problem enough attention to see any solution to the requirements to these carriers?

A. I have no solution to it but I have some ideas on the subject. I think the situation of the local operators today is not entirely dissimilar to the situation of American Airways in 1930. We were a disjointed group of small operators who operated with uncertain reliability and inadequate frequency of schedules. We sometimes took off on time and often didn't; we sometimes landed on time and often didn't. We left at uncertain hours, and somehow managed to pick up a few passengers from each of the towns to keep going.

In 1930 I made my first study of airline economics. The conclusion was that we could have done over 90% of our total job with equipment half the size. That I think is the situation in which local operators find themselves today. Lower costs per airplane-mile, higher load factors, more frequent schedules, better connecting services, and much better dependability, are, I believe, essential requirements.

Q. Their developments seem to be in the direction of larger airplanes with hoped for lower costs per seat mile, though?

A. That is right. I don't know whether they are asking for it or whether it is being handed to them. If you could take a DC-3 and could increase the width of the fuselage a foot and add another row of seats and change the 24-passenger job, to a 32-passenger job you would have increased the cost per mile of operation practically none at all; you would have changed the performance negligibly, so that your realized block speed would be just about the same as it is today. Therefore, your indicated cost per capacity seat-mile would have gone down substantially, but if you didn't fly a lot more people you would have lost no money whatsoever.

Unless the local service carriers suddenly have a tremendous expansion in business they are not going to be able to use efficiently the larger capacity airplanes, even if they cost the same per mile and show a lower cost per seat-mile.

Q. Will there be a DC-3 replacement? Is there a true need for one?

A. Yes, there will be a need for one because the DC-3's are going to wear out one of these days and you will need a new airplane in that general class. But while building one I would very carefully examine the overall capacities to find that the unit is not too big. I think it is much better to have the units a little too small than too big.

Q. What do you see as the role of the helicopter in the near future as a transport aircraft?

A. I don't see much role in the near future. In the ultimate future I think it will find its proper place in the picture. I don't think that there is any justification for operating single-engine-single-pilot helicopters at low altitudes over congested areas any more than there is justification for operating single-engine single-pilot transports. You are subject to just as much danger.

Q. How about multi-engine helicopters?

A. Well, multi-engine helicopters capable of maintaining altitude on one engine would be much safer for close-in operations. But all-weather operation is still a big problem, as will be congested air traffic with helicopters.

Q. How about the use of helicopters up to distances of about 250 miles as a replacement for local service airplanes?

A. I don't think I would go quite that far. I think the local service airplane will creep down into that picture to 100 miles as a minimum and the helicopter may creep up to 250 miles as its maximum, so there will be an overlapping area where you may have some helicopter service and some airplane service.

But right now, and as far as I can see ahead, the mechanical complexity, the high first and operating cost, the difficult control problems, particularly under bad weather conditions, and the somewhat disagreeable sensations of noise and vibration, are far from promising. We haven't faced reality with respect to proposals to operate helicopters in and out of city communities. The enthusiasm is great but the problems are very real.

Q. Industry inquiries here looking for engineering/management-minded personnel for top positions would indicate a decided shortage of this type mind in aviation. What might be done to correct this?

A. The total number of airline engineers is really insignificant, I would say not more than 500, and in the past the financial and promotion incentives in transport engineering have been very much lacking. I think of recent date we have been much more consistent with other rates of pay, although the comparative monies paid in design engineering are still much higher.

Perhaps I am prejudiced, but I believe the airlines and aviation in general would be benefitted by encouraging and developing more engineering-minded managements and more management-minded engineers.

Q. Do you feel that CAB has done a satisfactory job of regulating aircraft airworthiness and CAA in administering it, and what shortcomings, if any, do you see in the present Federal regulatory set up?

A. I would like very much to see in the CAB at least one individual with the experience and background of Ed Warner. He was familiar with all phases of the aviation business. I think the CAA is an experienced and capable organization, which tries to do a good job. They work very cooperatively with the industry.

Seating Densities for Tourist Service

Aircraft	Europe	North Atlantic	Europe-Middle East	Europe-South Africa	Europe-India	India-East Africa	India-Pakistan-Ceylon	Kenya-Mauritius
DC-3	21	..	..	21	..	..	21	..
DC-4	55	55	55	55	55	55	55	55
DC-6	60	60	60	60	60	..	60	..
DC-6B	77	77	77	77	77	..	77	..
Constellation (to 749A)	58	58	58	58	58	58	58	58
Constellation (1049)	78	78	78	78	78	78	78	78
Convair 240	40	..	40	40	..	..	..	..
Convair 340	48	..	48	48	..	..	..	..
Argonaut	54	..	54	54	54	54	54	54
Hermes	54	..	54	54	54	54	54	54
DC4M2 .....	..	40	..	..	..	..	..	..
Viking	36	..	..	27	..	..	..	..
Viscount	47	..	47	..	..	..	..	..
Breguet	107	..	..	107	..	..	..	..
Bretagne SO30	40	..	40	..	..	..	..	..
Ambassador	47	..	47	..	..	..	..	..
Scandia	32	..	32	..	..	..	..	..
Wayfarer	40	..	40	..	..	..	..	..
Languedoc	40	..	..	..	..	..	..	..
C-46	31	..	..	..	..	..	..	..

Low-Cost Global Air Service Seen by '54

Airlines accept principle at five-week IATA meeting; high density seating for 1,250 aircraft likely.

By ERIC BRAMLEY

CANNES, FRANCE—The world's airlines have accepted the principle that there shall be low-cost tourist air service to most parts of the globe by early 1954.

Far-reaching effects will come from implementation of the decisions made at the five-week meeting (longest on record) of the International Air Transport Association's traffic conferences here. The word "tourist" is a misnomer. In many places, particularly on short-haul European routes, it is expected that the low-cost service will become the standard service, and will be supplemented by surcharged deluxe flights. Even on the Atlantic, predictions are that before long 75% to 80% of passengers will ride low-fare services.

The decisions will also mean, according to Dennis Handover, conference chairman, that half of the airlines' 2,500 aircraft will eventually be converted to high-density seating, and that 5,000,000 more seats will be available in 1953 than in 1952.

Thus, disregarding the "tourist" description, what the airlines have done is to agree to lower fares in (for the most part) higher-density aircraft. Inasmuch as standard fares in most areas are high by U. S. standards, the new lower fares may be above U. S. first-class per-mile tariffs in some instances.

The tourist policy was not fully implemented at Cannes, however. Important details remain to be worked out. Low fares in some areas will not be effective until April, 1954. Pacific tourist tariffs were left to be decided at next November's conference.

It was necessary to reconcile the divergent views of 47 airlines (IATA decisions must be unanimous), some of which approached the tourist idea with enthusiasm, others with reluctance. Compromises were necessary in order to come out with any kind of an agreement on so important a question.

Fares established (subject to approval of governments) will be far from perfect. In some places, there will be standard fares, creative fares based on standard, tourist, creative based on

tourist, night tourist, and "B" fares (for operators of older-type equipment). The wide variation caused some concern.

The lower fares in different areas will not be a uniform percentage below standard. In one case, the reduction is as high as 39%, in other cases it is as low as 10%. It will average in the neighborhood of 20% to 25%. The reason for this is a complicated rate structure that has grown over the years and under which rates on all routes are not on the same basis. It was also the result of compromise. Because the tourist idea is so new, only experience will iron out the final pattern.

Viewpoints of those in attendance were to a large extent dictated by equipment considerations, and this was more a "conference of equipment" than any other IATA meeting. Those with adequate aircraft were inclined to push the tourist idea; those without adequate equipment were not as enthusiastic.

Status Quo

Observers also pointed out that the more enthusiastic supporters were those with a large traffic potential in their own countries that might be attracted by a lower-fare service. Those without this potential, and who rely for a large part on traffic from other countries, tend more toward the status quo.

However, the important accomplishment of the conference was the acceptance of the low-fare principle. Details will be settled over a period of years. This will be particularly true within Europe, where the present route and fare patterns have taken a long time to develop. A patchwork tourist pattern is inevitable for the time being.

A lot of traffic officials believe that in the future most of the business will be carried on low-fare services. First-class flights will carry businessmen on expense accounts, and people on journeys that are so long that they may consider it a hardship to ride tourist. In addition, there are people who will not ride anything but first-class, giving the service a certain hard-to-measure "snob value."

However, the apparent trend toward narrowing the difference between tourist and first-class was of concern to some officials. It was decided, for example, that meals are to be included in tourist fares, which are adjusted upward to cover them. Purpose was to eliminate bothersome paperwork and bookkeeping connected with the sale of meal tickets. Although there is considerable merit in the move, there was nevertheless a feeling that the meal charge will simply disappear into the fare, rather than remaining earmarked as such a charge.

The decision to sell liquor aboard tourist aircraft is also considered by some as a move that will narrow the difference between the services. This difference will consist principally of a smaller seat and less leg room on tourist, plus a more elaborate meal and possibly a free drink on first-class. And on some planes, even the seating will be the same.

Decisions on seating densities for low-fare planes (see chart) were also the result of compromises made necessary by equipment considerations. Thus, in some areas Convair 240's with a minimum of 40 seats will be used, plus

Convair 340's with 48 seats. This is standard U. S. seating.

An interesting development was Air India International's proposal for an unusually low fare on the Europe-India route. All proposed a reduction of 55% from standard fare for its Constellations, or about 3.5c a mile. Principal reason was said to be the need of India, only recently independent, to train its people for important positions. This necessitates cheap transportation to European educational centers.

Final Fare

The final fare for this route, ar-

rived at after lengthy discussions, will be \$336 one way, a 26% reduction. However, there will also be a seven-month off-season (August 1-February 28) fare, saleable only in India, of \$280 (4.5c a mile), or 39% off. It will be possible to buy a round trip in India at 10% off this fare.

On the Pacific, where the CAB has said it sees "no economic or operational basis" for establishment of a tourist service, the April 1, 1954, date was the result of compromise.

The Pacific featured principally the opposite views of two carriers—Canadian Pacific Airlines strongly in favor of an early tourist date, and Northwest Airlines claiming that the area, largely because of unsettled conditions, was not yet ready for this service. The problem was resolved by agreeing on the 1954 date, with a special emigrant fare to start a year earlier (see box).

Another much-debated subject was the use of combination aircraft, carrying low-fare passengers in one compartment in tourist seats, and first-class traffic in another in de luxe seats.

One school of thought held that combinations will lead to abuses—that traffic personnel with a lot of tourist passengers and few first-class would be tempted to take care of the tourists in the first-class compartment.

Proponents pointed out that in some areas where frequencies will be only one or two weekly, it will be impractical to use one plane for first-class and one for tourist. In addition, at least one airline (Trans-Canada) has ordered new equipment with combinations specifically in mind. The use of combinations will be permitted for the time being. The question may be reopened at a future conference.

Although the CAB had favored raising the Atlantic berth charges from \$35 to \$50 single and \$75 double, the fee will remain at \$35 for the coming year. Some carriers pointed out that the charge had only recently been raised from \$25 to \$35, and that more experience was necessary at that level before discussing another increase. There will be no charge for a fully-reclining seat (CAB had favored \$14).

On trans-Pacific to Australia there will continue to be no sleeper charge. This results from British Commonwealth Pacific Airlines' practice of giving each passenger a berth, by putting two people in a lower (with a "bundling board" between them). BCPA has explained that it cannot charge for a berth when it requires each passenger to have one, and that it also cannot charge when it puts two people in a lower.

IATA was faced with a contro-

Tourist Service Timetable

March 1, 1953—U. S. to Bermuda.

April 1, 1953—Service starts within Europe, and between Europe and Middle East gateways of Amman, Beirut, Cairo, Damascus, Haifa, Tel Aviv, and Nicosia (Cyprus).

October 1, 1953—Extension from Middle East to India, Pakistan and Ceylon, and between Europe and South Africa, both direct and via Middle East.

April 1, 1954—Extension to Hong Kong, Manila, and Tokyo, and across the Pacific from Asia and Australasia to San Francisco and Vancouver. Pacific tourist fares remain unsettled and will be decided at the next traffic conference meeting, probably in Honolulu in November. Special emigrant fare was established, effective April 1, 1953, from Tokyo and Hong Kong to North and South America. Hong Kong-U. S. will be \$500 (against \$726 regular), from Tokyo to U. S., \$450 (\$650), or a 30% reduction.

CONDITIONS OF SERVICE

Seating densities: Minimums were established for all types of equipment, ranging from 21 seats in a DC-3 to 107 in Air France's Breguet (see chart).

Meals: "Simple and inexpensive" meals will be served without separate charge, and fares were adjusted \$1 to \$5 upward to include them. Thus, New York-London rate increases from \$270 to \$275.

Liquor: It will be permissible to sell liquor aboard tourist flights.

Combinations: First-class and tourist-class passengers may be carried on the same aircraft, in different compartments.

Baggage: In Europe, tourist passengers will be allowed 33 pounds on trips on which first-class one-way fare is under \$140 and 44 pounds when fare is over that amount.

OTHER IMPORTANT IATA ACTIONS

Standard fares: No change in Western Hemisphere and across Atlantic and Pacific. A 5% increase on through routes from Europe to Middle East and India next October 1, when tourist service starts. A 10% increase between Rome, Athens and Istanbul next April 1, when tourist starts. Slight increase (up \$14 to \$504) London-Johannesburg next October.

Sleeper charges: Atlantic berth charge remains the same (\$35).

Regional fares: No recognition was given to lower regional fares ordered by Argentine government for Aerolineas Argentinas to seven South American nations. Fares, of course, will continue, but without IATA approval.

Cargo: Rates substantially the same for coming year, but a special February meeting will discuss means of developing additional Atlantic cargo.

No-show charge: The no-show charge that has been in effect in Europe was eliminated.

No action was taken by the conference on conditions of carriage, elimination of round-trip discount, free transportation, and overnight and connecting expenses.

versial issue in the Argentine regional fare proposal—the Argentine government's decree under which Aerolineas Argentinas' fare to seven neighboring countries is lower than that of the foreign trunk lines, regardless of equipment used. It is based on Argentina's belief that traffic between adjoining countries belongs to the carriers of those countries. This type of fare, unless it is based on older-type equipment, has been opposed within IATA.

The traffic conferences refused to give recognition to the fares proposed by Aerolineas Argentinas. The fares will, of course, continue, but without IATA approval. The conferences did not go further, as had been suggested by some people, and censure the Argentines. This step might have resulted in the resignation of Aerolineas, which would have solved nothing. Opinion was that the regional fare problem must be solved at government level before it spreads to other parts of the world. The U. S. and British governments are understood to have protested to Argentina.

Considerable attention was given by the conferences to the problems of the smaller carriers. Their "B" fares, based on older-type equipment, will be about 10% under tourist. Originally, these fares were confined to the Middle East, but have now spread to some areas of the Far East and West Africa.

The small carriers' position in IATA has changed somewhat. In the past, it was probably to their advantage to stay out of IATA and save the expense, because they could always charge less than the IATA tariff. This is now increasingly difficult because of the larger lines' more economical four-engine equipment. By joining IATA, the small airline can have its say on the fares that are established.

The Cannes meeting can be marked down as one of the most important in IATA history. It dealt with a low-fare service idea that was so new to many that debates and differences of opinion were inevitable. However, the airlines were able to compromise their differences and come up with a

pattern for a type of service that will have a profound effect on air transportation in all parts of the world.

NEWS BRIEFS

EQUIPMENT

Production of the Douglas DC-7 has started at Santa Monica.

Shipment of 252 one- to ten-place personal and executive aircraft by six companies during October reached a dollar value of \$2.6 million, according to the Utility Airplane Council of AIA.

Vickers Viscount will tour North American cities while testing cold-weather equipment for TCA, starting late in February.

TRAFFIC

More seat mileage than in any previous winter is being scheduled by TWA this year. During November and December the total reached eight million domestic seat-miles per day, up 39% from 1951 figures. Replacement of DC-3's with Martin 4-0-4's and use of new Super Constellations is credited.

INTERNATIONAL

Bilateral agreements for Japan are moving along. One with the United Kingdom has been negotiated, and two Japanese officials will soon visit Europe to start talks with Belgium, Denmark, France, the Netherlands, Norway, and Sweden.

SAFETY

An award for flying safety within the Air Force, the 1951 Daedalian Trophy, has gone to the Strategic Air Command.

AIRLINES

U.S.-Hawaii coach service at \$225 round trip, inaugurated by Pan American, was approved by CAB over the protests of a large irregular carrier which cited "safety hazard possibilities." Airline Transport Carriers, which operates low-fare Constellations to Honolulu, objected that the three-abreast seating in PAA's Boeing Stratocruisers was not in line with the results of safety studies recently conducted by United Air Lines and Cornell Aeronautical Laboratories.



All business is specialized

...and nothing specializes
on your business like your
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American Aviation

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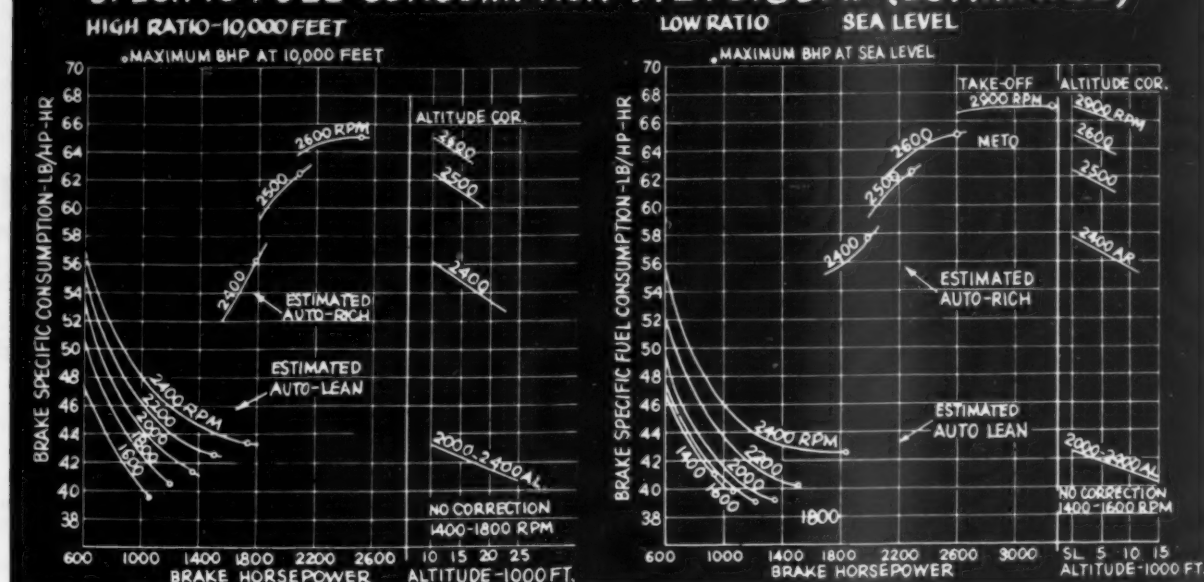
p. 45—Genack

p. 50—Air France

p. 65—Curtiss-Wright

WRIGHT TURBO-COMPOUND R-3350

SPECIFIC FUEL CONSUMPTION 972TC18DA1 (ESTIMATED)



Comparative Data on Turbo-Compound

Performance and construction features of power plant for DC-7 and 1049C off restricted list.

By FRED S. HUNTER

ROUGHLY speaking, the two leading U.S. manufacturers of four-engine transport, the Douglas Aircraft Co. and the Lockheed Aircraft Corp., are putting several hundred million dollars worth of faith in a new engine in their DC-7 and Model 1049C Super Constellation programs.

So, too, are the airlines which are buying these airplanes, at a time when the jetliner is flashing along in a 500 mph charge at the world's airline market.

The engine is Wright Aeronautical's Model 972TC18DA1 turbo-compound. This engine has been freely discussed in general terms ever since Lockheed first disclosed it planned to make use of it to advance its Constellation line to greater speeds, longer ranges, and higher payloads.

Until now, however, few details have been available because the power plant has remained on the Navy's restricted list. Although the first actual L-1049C order came from a foreign carrier, KLM, it has only been within the last 30 days that the engine which will

power it was released for export by the State Department.

Both Douglas and Lockheed are counting on service performance in military aircraft to provide them with a dependable transport engine and enable them to avoid the usual problems for an untried engine in their new type airliners.

In production since the end of 1949, the turbo-compound is being procured in quantities for the Lockheed P2V, Fairchild C-119, Martin P5M, and the Lockheed R7V-1, C-121, and WV2. These are patrol and transport types having operating requirements very similar to those of commercial transports.

Initial installation of the engine was in the P2V-4 and its greatest experience thus far has been in this series of far-ranging patrol craft. The model now in production is the P2V-6.

Wright Aeronautical has shipped more than 1,400 engines to date, and service time, currently being accumulated at the rate of 11,000 hours per month, is approaching 145,000 engine hours. The R-3350-34W, which is the Navy version of the 3,250 hp commercial engine, has

been authorized to operate 1,200 hours between overhauls.

The Wright TC18DA1 engine represents the application of three blow-down turbines to the Cyclone 18CA series engine to recover exhaust energy and convert it into useful work. The figures in the accompanying chart illustrate the improved performance gained through this power recovery system.

The extra power delivered during take-off, climb, and cruise makes possible the new high take-off weights of up to 133,000 pounds for the Super Constellation and 122,800 for the DC-7, as well as the economical climb required for long-range operation. The low fuel consumption, regardless of speed and altitude, extends fuel supply under all operating conditions.

The turbo-compound engine is 89.53 inches long overall and its diameter (maximum over cowl seal strip) is 56.59 inches. Its total dry weight is 3,484 pounds, making a low specific weight of 1.08 pounds per horsepower, including the exhaust system.

Standard equipment included in the total dry weight is as follows: Bendix Stromberg fuel injection system complete; Scintilla low tension ignition system complete, provision for double acting propeller; torquemeter; cooling air deflectors and baffles; 0.4375 reduction gear; accessory drives and accessory drive covers; Fireseal adapter complete; prim-

ing system on engine; two-speed supercharger; three blowdown turbines and associated mounting brackets; and exhaust piping between cylinders and turbines.

For maximum fuel economy, the turbine gear ratio in the commercial turbo-compound engine has been set to obtain higher turbine efficiencies in the cruise power range. The resulting lower gear ratio of 6.52:1 reduces turbine wheel speeds by 18% and decreases operating stresses approximately 33%. This, together with low wheel temperatures obtained by forced air cooling, the engine manufacturer points out, adds strength and durability to the turbine wheels.

Increased Strength

Wright Aeronautical has added 24 pounds, or an increase of 18%, in the weight of the crankshaft of the TC18DA1 engine as compared to its former C18BD (2500 hp) engine to beef up the center section and add to the ruggedness of the shaft.

Similarly, the forged head cylinder of the turbo-compound's engine has been made six pounds stronger, with an increase from 47.5 pounds to 53.7 pounds, and fin area has been upped from 3,838 square inches to 5,401 square inches, an increase of 41%, for increased cooling ability.

Power section of the turbo-compound crank case is machined from four instead of three steel forgings. In this modification, the two center section diaphragms form a rugged "V" support for the center main bearing.

Overhaul Fixtures

Overhaul of the power recovery system in most shops will require only two special fixtures purchased with the engines and, if not already on hand, one new machine for balancing the turbine wheels. Parts essentially new to operators not having turbo supercharger experience will be only the turbine wheel, nozzle assembly, cooling cap, and fluid coupling.

Wright points out that servicing of these parts will not require any unusual training or special skills. The remainder of the power recovery system consists of gears, shafts, bushings, etc. with which all maintenance men are familiar. Important from a line maintenance standpoint, the power recovery units are removable without requiring engine removal.

In the TC18DA1 recovery system each of the three turbines is driven by the exhaust gas from six cylinders through three separate siamesed exhaust pipes. They operate without special con-

How They Compare

The following engine comparison chart shows the points of similarity and difference between the military R-3350-34W turbo-compound engine, the non-compounded commercial C18CB engine, and the commercial turbo-compound engine:

	Commercial Turbo Compound	Military R-3350-34W	Commercial C18CB
Displacement, cubic inches	3350	3350	3350
Cylinders	18	18	18
Bore/stroke, inches	6.125/6.312	6.125/6.312	6.125/6.312
Compression ratio	6.7	6.7	6.7
Grade fuel	115/145	115/145	115/145
Take-off power	3250 bhp @ 2900 rpm	3250 bhp @ 2900 rpm	2800 bhp @ 2900 rpm
Max. cruise power low blower	1850-1910 @ 2400 rpm	No rating	1600 bhp @ 2400 rpm
Max. cruise power high blower	1750-1800 @ 2400 rpm		1500 bhp @ 2400
Supercharger drive ratio low blower	6.46:1	6.46:1	6.46:1
high blower	8.67:1	8.67:1	8.67:1
Turbine drive ratio	6.52:1	7.83:1	None
Turbine bucket material	Stellite -31	Stellite -31	None
Metering	Fuel injection (lightweight steel pumps)	Impeller In- jection	Fuel injection (aluminum pumps)
Fuel injection lines	Internal through rear section. Ex- ternal forward of fireseal	None	Steel external be- hind fireseal. External flexible forward of fire- seal
Water injection	Not presently used.	For emerg- ency use.	None
Manifold pressure regulator	None		None
Ignition	Low tension	Low tension	Low tension
Ignition timing	25° at takeoff, NRP and alter- nate climb, 35° for cruise	20° at take- off and NRP, 30° for cruise	25° at takeoff and NRP, 35° at cruise
Valve timing	Open	Close	Open
front, intake	45 BTC	56 ABC	45 BTC
rear, intake	55 BTC	56 ABC	55 BTC
front, exhaust	70 BBC	45 ATC	70 BBC
rear, exhaust	70 BBC	55 ATC	70 BBC
Injection pump timing	Injection ends 15 ATC (Intake)	None	Injection ends 65 ATC (Intake)

This list shows the basic engine has not been altered to produce the higher power, the displacement, compression ratio, supercharge size and drive ratio, valve timing, and engine speeds remaining constant. All the increase in power is due to the turbines. The comparison shows the military and commercial turbo-compounds are very similar, but there are some basic differences, such as fuel injection and water injection.

trols and contribute to the total useful work of the engine continuously over all operating conditions.

The muffling effect of the recovery system, Wright emphasizes, greatly reduces exhaust noise. It will make for a quieter ride.

Power generated by the turbines is transmitted through a turbine wheel shaft and a quill shaft to a set of beveled gears, through a fluid coupling, and thence to the main crankshaft gear. The turbine wheel shaft is supported by a non-rotating friction disk system which, along with the quill shaft, dampens the exhaust impulse loads and vibratory forces. The fluid coupling also keeps the turbine wheel under load while permitting the engine to accelerate and operate in a conventional manner.

The turbine system does not add to starting loads even in cold weather since the fluid coupling, being supplied by engine oil, is only partially full until the engine is operating.

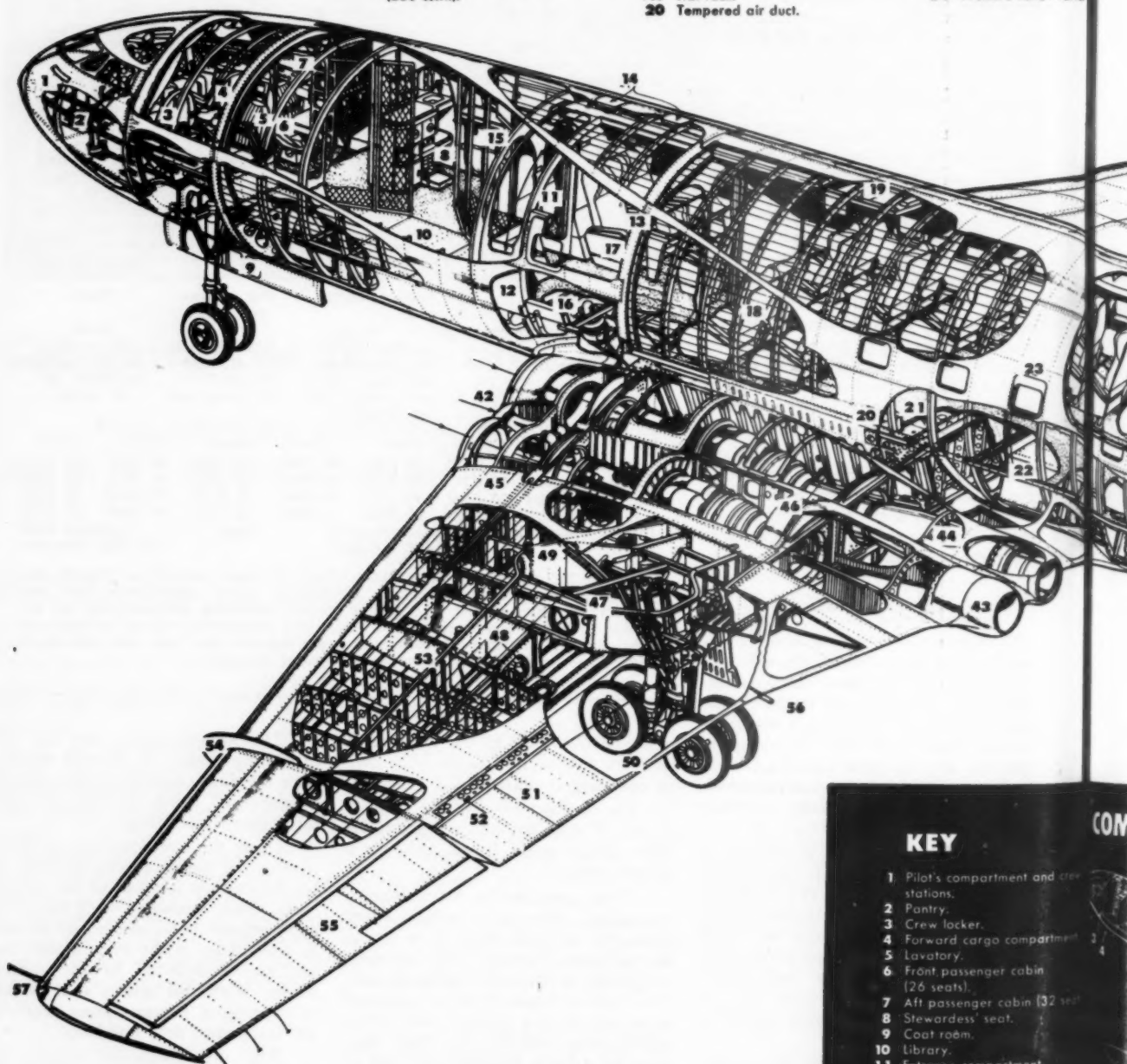
Using the blowdown system of recovery, the turbines are operated by the intermittent impulses of the exhaust gases which, instead of being bottled to apply pressure to the turbine, are allowed to blow down at the exhaust port and are merely deflected by the turbine blades. With this system and the use of short pipes, exhaust system pressures are maintained at a low level.

The turbo-compound engine, including lubricating system, radio shielded ignition, and fuel injection, is designed to function satisfactorily up to and including 35,000 feet. • • •

DE HAVILLAND "COMET" series 2

KEY

- | | | |
|---|--|---|
| 1 D.M.E. homing antenna slots. | 11 Stowage compartment (55 cu. ft.). | 21 Center-section fuel tank (185 cu. ft.). |
| 2 Nosewheel steering wheel. | 12 Used air, fed back for recirculation. | 22 Under-floor cargo compartment (185 cu. ft.). |
| 3 Captain's seat. | 13 Main fuselage former. | 23 Emergency exit. |
| 4 First officer's seat. | 14 Suppressed ADF loops. | 24 Access to 22. |
| 5 Navigator's seat. | 15 Crew entry door. | 25 Stewardess' table. |
| 6 Radio operator's seat. | 16 Cold-air unit. | 26 Library. |
| 7 Flight engineer's panel. | 17 Smoking lounge (8 passengers). | 27 Coat room. |
| 8 Buffet. | 18 Passenger seat (placed at 39 inch pitch). | 28 Ladies' powder room. |
| 9 Nosewheel door plate antenna (medium and HF). | 19 Hat rack. | 29 Men's room. |
| 10 Front cargo compartment (230 cu. ft.). | 20 Tempered air duct. | 30 Ladies' lavatory. |
| | | 31 Pressure relief valve. |



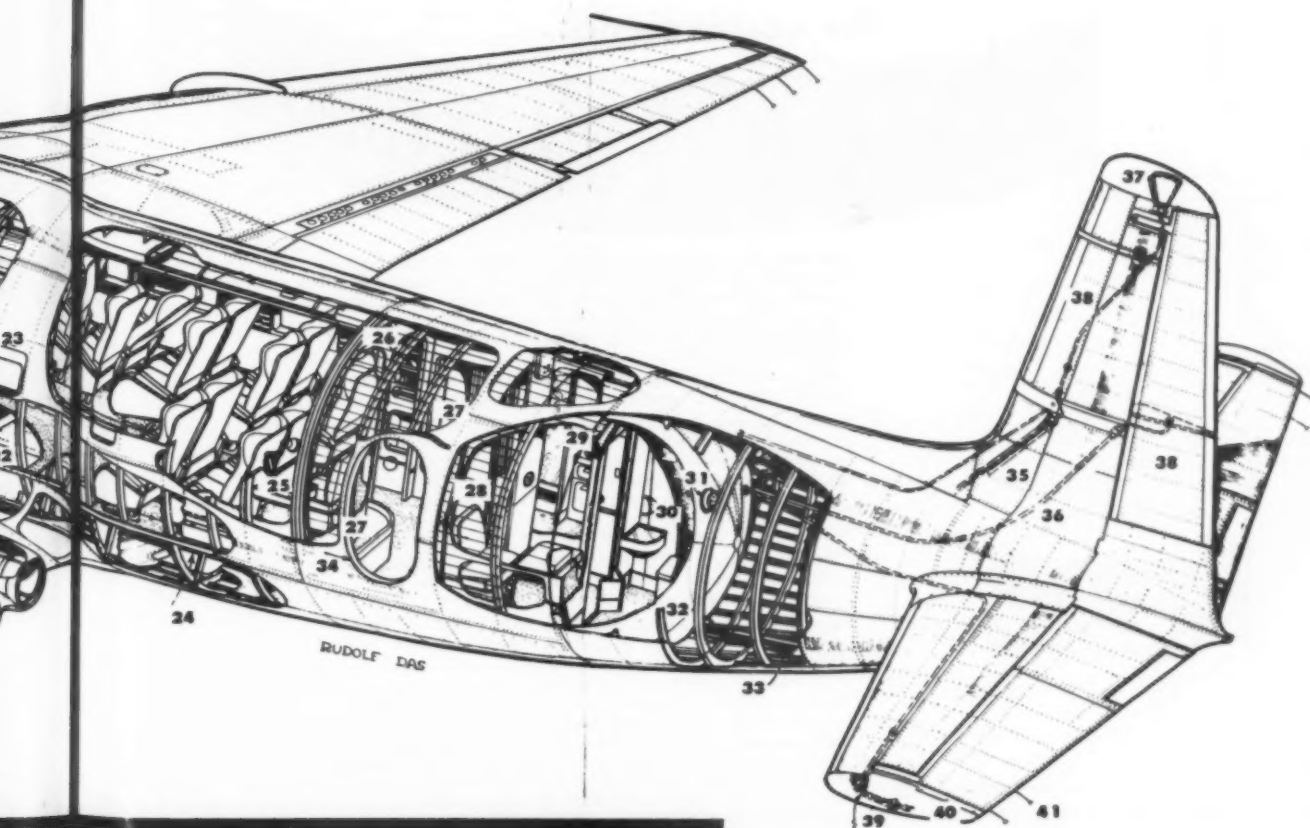
KEY

- | |
|--|
| 1 Pilot's compartment and crew stations. |
| 2 Pantry. |
| 3 Crew locker. |
| 4 Forward cargo compartment. |
| 5 Lavatory. |
| 6 Front passenger cabin (26 seats). |
| 7 Aft passenger cabin (32 seats). |
| 8 Stewardess' seat. |
| 9 Coat room. |
| 10 Library. |
| 11 Entrance compartment. |
| 12 Men's room. |
| 13 Lavatories. |
| 14 Women's dressing room. |
| 15 Aft cargo compartment. |

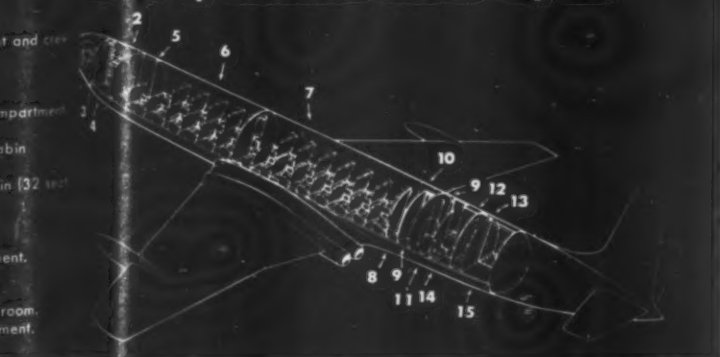
- 32 Pressure bulkhead.
- 33 Tail controls.
- 34 Passengers' entry door.
- 35 VHF antenna filter.
- 36 Fin excitation feeder (Medium and HF).
- 37 VHF fan antenna.
- 38 Metal fin and rudder acting as MF and HF antenna.
- 39 ILS localizer and ORB antenna.
- 40 Fibreglass stabilizer tip.
- 41 Static discharge.

- 42 Ram air intake for cooling air.
- 43 Stainless steel aft portion of cowling.
- 44 Inboard jet pipe with air cooling muff.
- 45 Twin rectifiers and voltage regulators.
- 46 DME distance antenna.
- 47 Main landing gear operating jack.
- 48 Retractable landing light.
- 49 No. 1 integral fuel tank in center section.

- 50 Bogie-type four wheel main landing gear.
- 51 Split-type flap.
- 52 Air brakes on upper and lower surface.
- 53 No. 2 and 3 outer wing fuel tanks (integral type).
- 54 Boundary layer fence.
- 55 Metal aileron with operator tab.
- 56 Fuel dump outlet.
- 57 Pilot head.



COMET 3, standard interior lay-out



Drawn for American Aviation
by Das Technical Artists, Netherlands



quart can
or 55-gallon drum

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SERVING INDUSTRY...WHICH SERVES MANKIND

Mach Two Aircraft Await New Engines

Flight at twice speed of sound demands solution to problems of engine size, temperature and pressure.

THE "supersonic barrier" now being nothing more than a routine flight transition period as the result of a highly successful high speed research program, plans are now being made for the development of aircraft to fly at *twice* the speed of sound, and beyond.

Two types of Mach 2 aircraft are under consideration: those which would cruise during most of a combat mission at subsonic speed and attain Mach 2 for brief periods—"supersonic dash," as it is called—and those which perform at Mach 2 throughout an entire mission.

Aerodynamically enough has been learned from the high speed research program to determine the general configuration requirements of such plane types, and although there will be problems, such as friction heating of the fuselage, to contend with, the airframe problem is not considered insurmountable.

One of the major problems will be in the development of extremely high thrust power plants to drive the Mach 2 plane. Although there are already several engines of 15,000 pounds thrust or better in various stages of development, even this tremendous power is not adequate for the task as far as operational aircraft are concerned. There is a requirement for a completely new round of engines within the next few years—and the power ratings of these new engines, propulsion engineers believe, will be in the 25,000-50,000 pound thrust bracket. The airplanes to be powered by these engines may have available more than a pound of thrust for each pound of gross weight.

Diameters Grow

Development of such engines will not be an easy task. For one thing, it is not just a problem of scaling up existing types. The streamlined configurations required for high speed supersonic aircraft will not permit huge-diameter engines, so the thrust increase will have to be obtained, for the most part, by development work inside the engine casing.

In addition, there is the problem of weight. One pound of weight added to an engine may add from three to 10 pounds of weight to the airplane; in one specific case it adds seven pounds. With even fighter-type planes now in the 40,000 pound class, it is obvious that the rising weight curve must be flattened out, and such weight reduction must

originate in the power plant. So, even in development work inside the engine casing, propulsion engineers must not only find new methods of increasing power output, but they must also appreciably increase the thrust *per pound of engine weight*.

The new series of engines will have to operate at extremely high temperatures to get the maximum thrust per unit of airflow. Current jets operate at turbine inlet temperatures of about 1,600° Fahrenheit, but to increase this temperature by only as much as 100° poses tremendous problems.

Nonetheless, engineers feel that the temperatures must go up, not one hundred, but several hundred degrees; some feel that the new round of engines may operate at as high as 2,500°. An afterburner, of course, provides higher temperatures, but it also adds to the weight and size problem. What is desirable is more burning in front of the turbine, so that the bulky afterburner can be eliminated completely.

New Cooling

Temperature increase will undoubtedly be one of the major problems in the development of the new engine series; it will require a lot of research on new methods of cooling, new metals or compounds of metals to withstand the terrific temperatures, etc. The surface has only been scratched in that field.

The new round of engines will also call for considerably higher pressure ratios than those in current engines. Where current models operate at a pressure ratio of about six, the high supersonic engines may go up to 12. Such pressure ratio increases bring on a whole new wave of problems: weight, leakage, compressor efficiency, complexity (one method of attacking the problem is to add internal gadgetry).

Possibly the greatest problem in this category is what engineers call "off-design performance." If the airplane is to operate at Mach 2 at high pressure ratio, good compressor efficiency must be obtained at that speed. This complicates engine performance in the lower engine speed ranges, since the compressor is not then operating at design efficiency.

This is not much of a problem in current plane types, where the difference in range of operating speed is relatively small. But as the design speed increases, efficient compressor operation at lower speeds becomes a major problem.

Engineers are now studying several methods of attacking this problem. One of the most promising is the dual-rotor, or "twin-spool," compressor system, wherein there are two separate rotors, each operating off its own turbine wheel through a concentric shaft arrangement. Thus, the two rotors can operate at different speeds.

At low speeds (engine starting and idling), without some modification to the single rotor system, the early stages of the compressor operate "stalled," while the latter stages "choke." With a dual rotor system, the front spool can operate at lower rpm, allowing greater air flow and killing the stall, while the rear spool operates at high rpm to cancel the choke. At very high speeds, the reverse conditions are true in the compressor, but again they can be compensated for by operating the front spool at high rpm and slowing down the rear spool.

Another approach to the off-design problem is "interstage bleeding," or drawing air away from the area between the stages. As stated before, the front stages of the compressor are stalled at low speed operation because they cannot pass all the air they want to, because there is an air "traffic jam" in the latter stages. The latter stages cannot get rid of the air fast enough, so they operate choked.

Thus, by bleeding air off the middle stages of the compressor, breaking the traffic jam, room can be made for the extra air the front stages want to handle and take some of the load off the latter stages.

Variables

The very-high-thrust engine will probably also have a number of internal "variables," that is, portions of the engine system which can change their characteristics during operation. There are several variables under consideration, but they cannot be mentioned for security reasons.

The aforementioned represent only a few of the problems and the lines of attack involved in the development of the new very-high-thrust engine series. Propulsion engineers admit that the program is in a very early stage and there is a tremendous amount of research and development work to be accomplished before the Mach 2 engine becomes a reality. But none of the problems appear insurmountable, and the Mach 2 airplane will probably be an efficient, operational vehicle within a few years. • • •

The Vehicles

SPECIFICATIONS AND AVAILABILITY OF COMMERCIAL HELICOPTERS

Approximate Specifications	Estimated Period of Availability		
	1955-1960	1958-1965	1963-1970
Dimensions			
Fuselage length (feet)	32-42	50-55	65-80
Overall length (feet)	48-55	80-90	130-140
Width (feet)	6-9	14-16	10-12
Height (feet)	13-16	15-18	24-27
Rotors			
Number	1-2	1-2	1-2
Diameter (feet)	53-35	53-44	85-80
Engines			
Number	1	2	2
Type	R ²	R ²	R-T-J ³
Weight			
Gross (pounds)	5500-8000	11,000-15,000	25,000-35,000
Empty (pounds)	3900-4800	7,000-12,000	20,000-22,000
Capacity			
Seats	8-10	15-21	30-40
Payload ¹ (pounds)	1400-2000	35000-3700	10,000-12,000
Speed			
Maximum (mph)	110-115	135-145	145-160
Cruising (mph)	85-100	115-120	135-145
Cost			
New ⁴	\$120,000-140,000	\$165,000-185,000	\$365,000-400,000
Modified	\$100,000-120,000	\$150,000-170,000	\$335,000 up
Direct Aircraft Operating Costs			
Per Available Seat-Mile ⁴	\$0.09-\$0.10	\$0.06-\$0.07	\$0.04-\$0.05

¹ At 50-mile range.

² Reciprocating.

³ Reciprocating/Turbine/Pulsejet or Ramjet.

⁴ These costs, as well as all others in this report, are based on current price levels.

Source: Manufacturers' Specifications.

future will look like has been listed in table form, as shown at left.

The physical appearance of these listed aircraft will reflect the design objectives of various development periods in this manner: general design complexity and marked expansion of payload, speed, and range until 1960, at which time design simplification will begin to dominate, thereby dropping operating costs and fares.

The surveyors, looking at the decade beginning in 1955, said that although military type helicopters may be made available for commercial operations, the cost for modification required of these craft for commercial use will be extensive. When completed, however, direct operating costs of \$0.09 per available seat-mile appear possible.

The era of the helicopter will not appear all of a sudden in commercial operations, but will develop in the following ways. Airport shuttle service, first; intercity hauls, second; and finally, suburban operations. When these will occur and how much money they will take from the helicopter riding housewife with just a few hours to spend downtown in shopping is charted here.

ESTIMATED FARES FOR HELICOPTER SERVICES (cents per passenger-mile)

Type Service	1953-55	1955-60	1960-65	1965-75
Aerocab (airport shuttle)	40-50	30-40	25-30	20-25
Intercity	..	12-13	9-10	6.5-7.5
Suburban	..	..	11-13	8-10

The key to successful helicopter operations is the ability to operate directly into the center of town. Therefore design, location, and construction of midtown airstop facilities will confront planners with most of the well-known problems of airport planning, but in a more complicated form, and with many additional problems more often found in the realm of city planning. Future problems include:

- Very little latitude in where the heliport can be placed (must be city center).

- Noise of operations will be a primary, not secondary factor.

- Special zoning.

- Even though heliports 200' by 800' were drawn by the group, this would be mid-city property and expensive.

In the final analysis, the entire transport helicopter industry-to-be will be confronted with the problem of cost that faced the pioneers of fixed wing transport, or even rail travel: to bring the cost of its service down into the realm of its principal competitor.

• • •

Study Charts Transport 'Copter Future

**Six million helicopter passengers annually forecast
for New York by 1975; 30-place craft by '58.**

By HAL TUFTY

THE PORT of New York Authority, so concerned with the potential growth of the helicopter that it ordered an \$80,000 traffic trend survey for transport helicopters for as far ahead as 1975, has found that over 6,000,000 intercity, suburban, and aerocab passengers will ride helicopters in and out of Manhattan during 1975.

Over 40,500,000 pounds of airmail and 6,500,000 pounds of cargo will be carried on the same routes that year, predicts the year-long study prepared by a group of four consultants under the direction of Grahame H. Aldrich, senior analyst on the research staff, Air Transport Association.

Some of the specific findings and conclusions:

- The Korean war has advanced common carrier helicopter operations by five to 10 years.

- Within the next few years, a 10-place helicopter will be used in common carrier service.

- By 1958, 30-place machines will ply the commercial lanes.

- The potentialities of the helicopter cannot be realized unless attention is promptly given to the study of actual heliport landing sites, nor can these predictions come true within the survey's timetable unless the Federal government is prepared to include this new aircraft in its established fixed-wing policy of aid to commercial air transport and to include heliports in its airport aid programs.

Just what these rotorcraft of the

The Cost to the Passenger

Comparison of Railroad Commutation and Helicopter Fares and Travel Times to Selected Suburban Cities

City	Rail Miles	Time (in minutes)		Reduction in Time	Fare			
		Rail	Helicopter		Rail	Helicopter	Fare Differential*	
					Commu-tation	One Trip		
Babylon	35	69	29	57.9%	\$.54	\$1.23	\$2.45	\$1.22
Danbury	65	115	55	52.1	.77	2.29	3.95	1.66
Flemington	51	112	41	63.4	.59	1.89	3.57	1.68
Greenwich	28	57	17	70.2	.41	.98	1.96	.98
Huntington	37	75	30	60.0	.53	1.30	2.59	1.29
Morristown	28	69	17	75.4	.50	.98	1.96	.98
New Canaan	41	67	28	58.2	.49	1.44	2.87	1.43
New Hope†	74	94	48	48.9	1.52	2.59	5.18	2.59
Norwalk	41	56	24	57.1	.50	1.44	2.87	1.43
Princeton	48	49	31	36.7	.68	1.68	3.36	1.68
Ridgewood	22	59	14	76.3	.42	.77	1.54	.77
Tuxedo Park	44	93	43	53.8	.54	1.33	2.66	1.33
Stamford	33	46	28	39.1	.43	1.16	2.31	1.15

* Comparison of helicopter with rail one-trip fare.
† Via Trenton.

The Cost to the Operator

Helicopter Types Now in Production or Advanced Stages of Design

Model Designation		First Production Year	Cost Per Available Seat-Mile ¹	Manufacturer
Commercial	Military			
S-51	H-5	1946	\$0.203	Sikorsky Aircraft
—	XHJD -1	1947	0.086	McDonnell Aircraft Corp.
S-52	H-18	1947	0.164	Sikorsky Aircraft
47D-1	{ H-23A HTE-1	1948	0.344	Hiller Helicopters
48	{ H-13D HTL-4	1948	0.350	Bell Aircraft Corp.
K-5	K-225	1950	0.455	Kaman Aircraft Corp.
S-55	H-19	1950	0.089	Sikorsky Aircraft
360	H-12	1950	0.091	Bell Aircraft Corp.
PD-22	H-21	1951	0.065	Piasecki Helicopter Corp.
—	2	1952	0.058	2
—	2	1955	0.073	2
H-40 ³	—	1965	0.037	Hiller Helicopters

Source: Engineering releases of helicopter manufacturers.
¹ Computed for flight distances ranging between 51-100 miles.

² Designation restricted.

³ Preliminary design study.

Annual Passenger Potential

New York/Newark
1955-1975

	Aerocab	Intercity	Suburban	Total
1955	225,000	75,000	.....	300,000
1960	1,177,000	791,000	.....	1,968,000
1965	1,371,000	1,274,000	318,000	2,963,000
1970	1,536,000	1,555,000	1,912,000	5,003,000
1975	1,610,000	1,746,000	3,016,000	6,372,000

Cargo Potential

New York/Newark

Year	Pounds
1955	1,000,000
1960	2,400,000
1965	3,700,000
1970	5,100,000
1975	6,600,000

Air Mail Potential

New York/Newark

Year	Pounds
1955	7,400,000
1960	14,200,000
1965	22,500,000
1970	32,500,000
1975	40,700,000

The Heliport

Space-Weight Criteria

- (a) Landing—take-off area one landing and one take-off platform 200'x250'
- (b) Wheel loading* 19,000 lbs.
- (c) Loading—unloading area 30'x90'
8-17 loading positions
- (d) Weight to be carried by each loading—unloading unit* 25,000 lbs.

Obstruction Criteria (Major and Secondary airstop)

- (a) Desired maximum elevation of operational area above street level 100'
- (b) Minimum lateral obstruction clearance ... 100'
- (c) Minimum approach obstruction clearance† 35°
- (d) Desired minimum width of approach and departure path 500'

* 30-place helicopters anticipated. This would have to be increased 50% when 40-place equipment becomes available.

† Measured from end of landing platform plus 100 feet.

Maximum Transport Seating

LEGAL LIMIT

Airplane	Max. No. of occupants	Exits
B-307	61	4
B-377	96	9
C-46	67	4
CV-240	53	6
CV-340	53	6
DC-3	35	4
DC-3 (Super)	39	5
DC-4	86	5
DC-6	87	7
DC-6B*	112	11
L-18	17	3
L-049, L-649, L-749	87	7
L-1049	96	9
M-202	53	6
M-404	53	7

* The DC-6A, if converted to a passenger transport configuration, will be governed by the maximum number applicable to the DC-6B.

CURRENT PRACTICE

Douglas DC-4

American, 1-65
Braniff, 6-48 and 1-44
Capital, 9-60, 3-55 and 12-50
Colonial, 452
Delta, 5-55
Eastern, 8-68 and 3-60
National, 6-69
Northwest, 8-62, 1-66, 1-58 1-51, 7-50 and 5-40
Pan Am, 15-55
Trans World, 1-70, 6-60 and 1-40
United, 16-66, 1-44 and 2-20
Alaska, 2-55

Douglas DC-6

American, 8-70, 6-52, and 35-57
Braniff, 9-52
Delta, 7-56
National, 7-58
United, 9-52, 34-56

Douglas DC-6B

American, 17-57
United, 19-64
Pan Am, 17-85

Lockheed L-49 thru 1049

Capital, 7-55
C&S, 6-56
Eastern, 20-60 and 14-88
Trans World, 8-81, 32-57, 5-71, 21-49 and 4-38
Pan Am, 4-70 and 12-50
Calif. Central, 1-61

Boeing 377

Northwest, 10-75
United, 6-71
Pan Am, 15-75 and 13-80

Irregular Carriers

Airline Transport Carriers, L-49, 1-61
(All others Douglas DC-4 as follows)
Cal-Eastern, 3-47, 1-44, 1-59 and 1-64
Great Lakes 1-79
Hemisphere, 2-79
Overseas National, 1-34, 1-60, 1-52 and 1-44
Seaboard & Western, 6-66 and 2-44

Trans American, 1-79
Trans National, 1-79
Transocean, 6-60 and 1-71
Twentieth Cent., 1-79
U. S. Aircoach, 1-68
U. S. Overseas, 4-70

Coaches: How Many Passengers with Safety?

United Air Lines cuts coach seating and highlights problems of high-density evacuation.

By WILLIAM D. PERREAULT

WE HESITATE to make this decision because of our concern that it may arouse public debate with carriers who may disagree with our findings, or that it may arouse public criticism of your administration. We concluded that honesty to the public was our first responsibility."

With this advance apology to CAA Administrator Charles F. Horne and the industry at large, United Air Lines president W. A. Patterson cut the maximum number of passengers authorized on UAL Douglas DC-4 flights from 66 to 54. His reason: "Our research indicates that, in the event of a take-off or landing accident, high density loading might cause undue congestion and thereby create a safety hazard."

Patterson's ability to prophesize the industry's reaction proved infallible. Almost overnight his action and the reasoning behind it became a storm center in which United found few sympathizers, either in government or industry.

One reason for the industry sensitivity to this issue was that it was not unaware of the problem. Within a few days of the United decision CAA re-

leased a detailed report on Aircraft Emergency Evacuation in which it attempted to analyze the pros and cons of more rigid evacuation requirements.

As recently as October 27 the Civil Aeronautics Board adopted Special Regulation 389, which set new standards for transport aircraft passenger capacity based on the ratio of passengers to exits on each type of aircraft. The result of this regulation was the accompanying table. By way of comparison another table shows the actual passenger capacity of these same aircraft as now operated by the airlines.

CAB noted in this special regulation that "more stringent rules should apply to all large airplanes carrying passengers for hire. A study of current type airplanes indicates that in some instances the exit facilities have become marginal for the number of occupants carried."

Despite this awareness that all was not well, Patterson's action and his manner of making the public announcement (first public comment was in a by-lined story by Wayne Thomis in the *Chicago Tribune*) aroused considerable debate.

In the flurry of activity which followed Horne wired Patterson: "Careful studies of Cornell report do not appear

to provide sufficient new knowledge to warrant changed recommendations to CAB for new regulations. The basic factor in both Cornell and previous studies appears to be that improved crew training is most valuable in insuring rapid evacuation, and that each seat configuration is not important."

Actually Horne was referring to the results of a study of 49 airlines made by CAA agents that showed that training of crews relative to emergency evacuation "ranges from irregular or none to continuous programs." This is how the survey summarized such training activities:

Flight Attendants
(Frequency of periodic training)

Airlines	Frequency
25	six months or less
9	annual
6	continuous
3	initial training only
2	irregular
2	not indicated

Flight Crews
(Frequency of periodic training)

Airlines	Frequency
26	six months or less
8	annual
6	continuous
5	initial training only

- 1 irregular
1 not indicated

Adequacy of exits is difficult to measure. A major factor is the matter of aircraft position following the crash. Most evacuation tests have simulated the condition with the gear retracted and the passengers escaping through the exits onto convenient platforms. In practice, descent devices (ditching ropes, slides, ladders, etc.) must often be used. This slows down evacuation, increases injuries.

Fire Involved

CAA's study of 122 accidents of tri-cycle geared aircraft over a four year period showed 55.7% involved wheel-down conditions, of which 28% involved fire. Another 23% of the accidents involved wheel-up conditions and 50% of these involved fire. Twenty-three per cent of the accidents studied involved partial gear failures.

United, like many airlines, has given considerable study and research to the whole subject. The clincher in United's case was apparently the special tests conducted by Cornell Aeronautical Laboratory at UAL's expense. One result of these tests was a movie on evacuation. This has been shown several times since the Patterson announcement to industry and government groups.

Consensus of those seeing the movies is that they produce no new evidence which has not been considered and rejected by the industry and government. United officials also referred publicly to tests by the National Advisory Committee on Aeronautics. Results of these tests are still classified and the partial disclosures stirred considerable fuss among the NACA committee membership, but meaningful details remained unavailable.

Good Faith

At this time the whole matter is very much up in the air. Everyone is agreed that United acted in good faith in backing up what it considers to be the findings of its long and expensive tests. CAA, CAB, and the industry have again reviewed these findings and, inasmuch as can be learned, again rejected the need for changes beyond those recently adopted.

None of this directly affects coach service in Douglas DC-6's or Lockheed Constellations. The implications of the United conclusions could later involve these types, but the present thinking is that the whole episode may be settled in the long slow process of future airworthiness meetings. • • •

Lear Autopilot to be Tested in DC-7

Certification for DC-6A and B may be followed by installation in Comet; weight under 70 pounds.

LEAR, INC. is preparing to move into high gear in pushing forward its new L-5 automatic pilot and approach coupler following CAA certification of the unit in Douglas DC-6A and DC-6B aircraft.

Representatives of American Airlines, United Air Lines, and Douglas Aircraft Co. were observers aboard the Slick Airways DC-6A air freighter on the CAA flight tests, which required only 6 hours and 50 minutes of flying time to complete.

Agreement also has been reached with American Airlines for the first Douglas DC-7 to be equipped with an L-5 which will make it possible for the Lear autopilot to be CAA certified in this equipment at the same time that the airplane is tested for its type certificate.

An early next step may be an installation on a Comet jetliner, since British Overseas Airways Corp. has been reported as interested in trying out the new Lear product. Only available British device is said to have a 1,000-foot limitation.

On the CAA certification flights, actual weather approaches to the runway were made with the automatic pilot being disengaged at less than 50 feet. At the conclusion of the demonstrations, CAA representatives informally expressed the opinion that it ultimately should be possible to lower the minimum to 100 feet.

Lear has started preliminary negotiations for pilot installations on other late-model airline equipment, including the Lockheed Super Constellation, the Convair 340, the Martin 4-0-4, and the Boeing Stratocruiser, for extension of CAA certification to these aircraft.

Certification of the various installations is expected to be entirely routine as the only difference is in the calibration panel, which, of course, requires adjustment to fit each particular type of equipment.

Lear has not arrived at a price for the L-5. It may cost somewhat more than other automatic pilots, but it is expected to stay within a competitive price range. This means it probably will cost something in excess of \$15,000 or \$16,000 installed. There is a possibility Lear will work out a means whereby the equipment can be leased by airlines.

The L-5 is a commercial version of the F-5, which was developed by William P. Lear, chairman of the board

and director of research and development for Lear, Inc., to provide the Air Force with an automatic pilot for fast jet planes making use of boost in their controls. With its follow-ups on the actual control surfaces instead of the servos, boost has no effect on the operation of the F-5—or its commercial counterpart, the L-5. It goes through any type of boost.

In addition to its performance features, Lear expects the L-5's light weight to be an important consideration for airline users. It will weigh less than 70 pounds, installed in any type transport.

Ward D. Davis, former sales manager of the electronics division of Curtiss-Wright who has just become manager of airline sales for Lear, also estimates that maintenance costs will be cut approximately one third because of plug-in type components, quick disconnects, tube standardization, and a three-axis amplifier control unit which houses the gyros, the servo amplifiers, the power supplies, slaving and multiple channels, trim tab output tubes, and power rectifier in one unit.


The L-5 can be installed in an operating transport during the regular periodic checks. Lear's estimate is that the installation can easily be completed in 10 landings.

The test installation in the Slick DC-6A was accomplished in the above manner over a period of 60 days without taking the airplane out of service. This is somewhat faster than normal because, anxious to hasten the CAA certification, Lear performed the calibrations in flight and had a man with the airplane almost constantly to be ready to take advantage of any spare ground time.

Lear anticipates a volume between \$10,000,000 and \$20,000,000 annually in sales of its new automatic pilot and approach coupler. It is in volume production on the military F-5, which is standard equipment in two of the Air Force's fastest jets, North American Aviation's F-86D and Republic's F-84G, and recently was installed in a Douglas R4D-8 (Super DC-3) for Navy test.

But Lear is in a good position to handle increased production of both military and commercial units because of an investment of \$9,000,000 in tooling and the availability of production facilities both in Grand Rapids and Los Angeles. Plans are for the commercial L-5 to be assembled in the California plant. • • •

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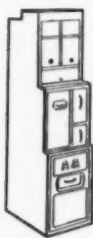
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Extra Section

By William D. Perreault



BILL LEAR, founder of Lear, Inc., recipient of the Collier Trophy in 1950, and presently director of research for Lear, Inc., is convinced that certification of the L-5 autopilot for use in the Douglas DC-6A represents some kind of a record. It seems that final approval was given at 1:30 a.m. after a full day of testing that had started at 8 a.m. the previous morning and included tests under every possible configuration and load. Lear gives much credit to two CAA agents, Bill Gray and Wally Frey, for their whole approach to the problem. United Air Lines and American Airlines both had representatives along for the tests.

Construction of Singapore's multi-million dollar international airport is being held up by a 30-year old bo tree. The 80-foot tree is used by the colony's Buddhists as a shrine, being a sapling of the original bo tree in India under which Buddha sat, according to reports from Singapore. Engineers have been attempting to devise a method of moving the tree 200 yards without killing it.

More and more we hear claims about pills of all varieties being combinations of medically proven ingredients. So it is with the newest of air sickness cures. In tests at the Air Force's Randolph Air Force Base, two Parke-Davis & Co. remedies for motion sickness have been combined in a new mixture which has proved very effective. The Parke-Davis tablet is a mixture of benadryl and hyoscine. None of the 61 airmen taking the Parke-Davis tablet experienced severe air sickness (nausea or vomiting), while 20.6% of those given a placebo did report serious discomfort. Normal dosage of the pill is one tablet taken a half hour before departure.

Convair 240's have logged more than one million hours in the air since they were first put into service by American Airlines on June 1, 1948, and have flown over 4,100,000,000 passenger-miles. American's fleet of 78 Convairs is the biggest among the 160-odd planes in service with six domestic airlines, eight foreign airlines and three corporations. Highest time on any one airplane is claimed by Trans-Australia Airlines, which has logged nearly 11,000 hours on one of its CV-240's.

Some interesting facts on the de Havilland Comet's hydraulic system, as disclosed during the recent Vickers hydraulic conference in Detroit: four engine pumps and two electrically driven pumps are used to supply Lockheed 22 castor base fluid at 2500 psi to a system divided into five small systems and incorporating 13 piston-type accumulators. Main system (color coded green), operates landing gear, steering, wheel and air brakes, flaps and flight control secondary servo units; servo control system (blue) operates flight control primary servo units only and cannot serve or be served by any other system; servo control emergency (yellow) operates flight control secondary units only; standby (red) is emergency system for main system functions and ground testing of all components except flight control primary servo units; and hand pump which operates landing gear extension only.

Sounds like a lot of money—\$85,000—but that's what Northwest Airlines estimates as the cost of the tires on its fleet of aircraft, about 500 tires of various types. Original cost ranges from \$38.81 for a DC-3 tailwheel tire and \$123.98 for the main wheel tire on this plane up to \$326.11, including tax, for a single Stratocruiser main wheel tire. Use of nylon vs. rayon also affects initial cost, with a DC-4 main wheel tire with rayon casing costing \$136.37 vs. \$182.17 for one with nylon casing. Northwest, according to Bob Johnson, re-capped 400 DC-4 main wheel tires in 1951 and 100 nose wheel tires and 240 Boeing main wheel tires and 220 nose wheel tires.

Douglas Aircraft Company's chief test pilot, John F. Martin, also adds a few facts for today's education. He estimates that the company's 34 test pilots currently active in testing 28 experimental airplanes, will log approximately four million miles this year.

Maintenance Bulletin Board



WATER SERVICE cart improvised from discarded aluminum beer barrel.

Beer Barrel Speeds Capital Servicing

A discarded aluminum beer barrel has brought Capital Airlines the solution to the problem of servicing its Lockheed Constellation lavatory water supply at the Milwaukee, Wisconsin, station. An operation which heretofore took two men from 12 to 15 minutes can now be completed in a matter of two or three minutes.

Under the past procedure used by Capital at Milwaukee it was necessary to run a hose connected to the city water out to the airplane located far out on the apron. Passengers often had to step over the hose when boarding the plane.

A discarded aluminum beer barrel together with a two-cylinder gasoline engine driving a rotary type pump was mounted on a small, three-wheeled, rubber-tired hand truck. Operable by one man, the new portable reservoir and pump permits refilling the water supply in two or three minutes.

Capital has other plans for the new unit. By filling the barrel with alcohol or glycol and attaching a spray nozzle to the end of the hose, it will be used to remove ice from wings and propellers during winter operations.

Fire Prevention Tip On Engine Valves

An unusual experience . . . a fire prevention tip. While packaging for shipment an engine cylinder that had failed, an airline reports, the box burst into flames. When water was applied the flames increased rather than diminished. Investigation showed the fire to originate from sodium in a damaged exhaust valve.

The explanation: with the valve damaged and the sodium exposed to moisture, hydrogen gas was emitted and contact with water or alcohol caused the sodium to ignite.

Aviation Lamp List

All types of aviation lamps produced by the Westinghouse Electric Corporation are listed and cross-indexed as to the military service stock number and the company number in a 15-page catalog No. S-60, available through the Westinghouse Lamp Division.

Dividing aviation lamps into seven commercial classifications, namely miniature, large series, large multiple, glow, fluorescent, mercury-vapor and all-glass sealed reflector, the catalog provides dimensions and capacities of 299 lamps manufactured for aircraft and airport lighting use.

Corrections in October 27 issue:

Page 28: Receiver item 21 credited to Aircraft Radio Corp. instead of Bendix Radio, division of Bendix Aviation Corp.

Page 84-85: Engine Overhaul Facility Listing:

Delete P&W R-4360 for Pacific Airmotive Corp., Linden, N. J.
Add California, Pacific Airmotive—Burbank for P&W R-985, 1340, 1830, 2000, 2800 & 4360. Cycle time for all engines—35 days.

Page 111: Test Stands Control Cable Load Test Unit: credited to Durham Aircraft Service, Inc., in error.

Page 120: Fabric Use Data: Frontier Airlines listing, revise Curtains—add Bridgeport Fabrics; Leather—add Payne & Co.; Wall & Ceiling—delete Payne & Co.

Aircraft Costs Per Seat Mile At 2,000 Hrs. Utilization

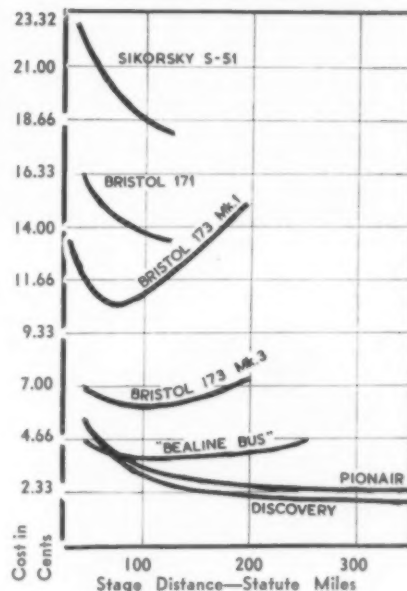


CHART ABOVE appeared in the December 8 issue as part of a story on British helicopter plans. At that time the figures indicating the stage lengths were omitted by error.

Daily Utilization

DOMESTIC CARRIERS

Average Revenue Hours of Use Per Day Per Aircraft for All Types of Service

	July	August
American	7:40	7:50
Braniff	7:50	7:18
Capital	8:11	7:59
Caribair	4:00	4:42
C & S	9:11	9:07
Colonial	7:59	8:34
Continental	6:38	7:02
Delta	8:22	8:25
Eastern	7:41	8:07
Hawaiian	6:28	7:38
MCA *	6:02	5:56
National	8:32	8:33
Northeast	7:42	7:35
Northwest	9:11	8:53
Trans Pacific	8:46	8:52
TWA	5:30	5:27
United	7:45	7:49
Western	7:51	7:59

* Braniff-MCA merger effective August 16, 1952.

NOTE: Above figures include utilization of aircraft in both scheduled and non-scheduled service. Prior to July utilization figures covered only scheduled operations.

New Products

Packaging Plastic

A packaging material called Calresin CPC can be molded or formed inexpensively into any form to fit the article it is to protect, according to the manufacturer, the Calresin Corporation.

A compound polyvinyl chloride, the new material also features the ability to be molded with a covering of cloth or other material on either side, bonding to any known surface. It is said to be fungus proof and will not support combustion.

Address: Calresin Corporation, 33 N. Santa Anita, Arcadia, Calif.



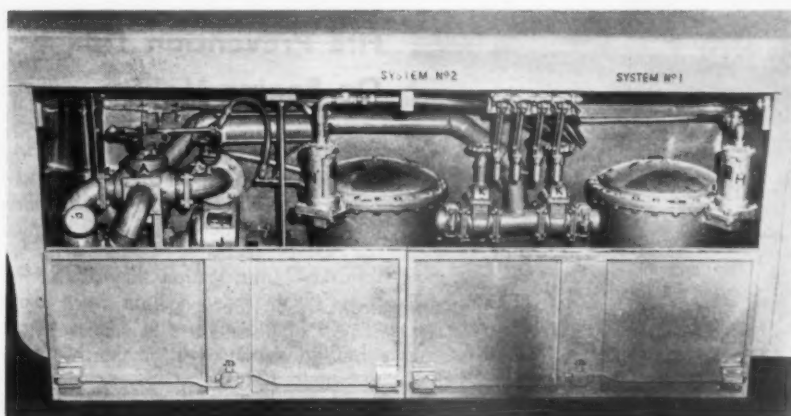
Test Accelerator

A test device, called the Model "C" G-Accelerator has been placed on the market by Genisco, Inc., and is intended to permit testing of aircraft and guided missile components up to a volume capacity of 18" x 18" x 24" and 100 pounds weight.

Providing a maximum acceleration force of 2,000 g-lbs., e.g. 100 lbs. at 20 g, 40 lbs. at 50 g, the Model C accelerator incorporates optical, pneumatic, and electrical systems and permits observation of test equipment under simulated operating conditions. Test objects are mounted in the center of a 24" square platform with a speed adjustable from 5 to 280 rpm and develop normal acceleration forces up to 75 g. Elapsed time from standstill to full speed operation is said to be approximately 30 seconds.

Structure of the test device is principally heavy aluminum plate to provide the maximum in rigidity at a minimum of weight. Housing guard wall is 96" in diameter, 24" high and 5/16" thick. With side sections removed, width is 31", permitting passage through narrow doorways and corridors.

Address: Department AAH, Genisco Incorporated, 2233 Federal Avenue, Los Angeles 64, Calif.



Micronic Filter Units

Micronic filter units, in a new series using resin-impregnated element filters, have been introduced by Purolator Products, Inc.

For use with aviation gasoline and other distillate fuels in capacities from 15 to 1,500 gpm, the new units can be furnished in either vertical or horizontal models,

with or without air eliminators and/or pressure gages. Initial pressure drop across the filters at rated capacity is approximately 1.5 psi. Units are water- and acid-proof, and pleated design provides large filtering surface.

Address: Purolator Products, Inc., Rahway, N. J.



Sensitive Relay

A sensitive relay primarily intended for use in airborne equipment has been placed on the market by Neomantic, Inc.

A hermetically sealed unit, the Neomantic relay is 1" in diameter, 2 3/8" high, and weighs 2.14 oz. Its sensitivity runs as low as 10 milliwatts and unit will operate as low as 0.010 amps. Contacts are single-pole, double-throw to 3 amps, 24 volts d-c; 115 volts a-c non-inductive. Coil resistances are available from 4 to 20,000 ohms and standard temperature range is from -55° to +85° C. Said to be well adapted for use with transistors and germanium diodes, aircraft applications include radar, radio, rockets and guided missiles.

Address: Neomantic, Inc., Los Angeles, Calif.

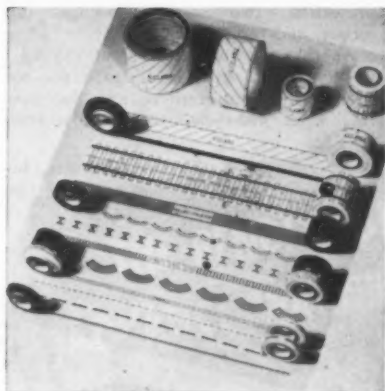


Crimping Tool

A hand tool for crimping solderless wire terminals, called the AMP CERTI-CRIMP, has been announced by Aircraft-Marine Products, Inc.

Features of the new tool are a wire positioner which prevents the insulation on extremely thin sheathed wiring from being inserted in the terminal barrel and two other positioners, one of which guides the terminal correctly in the tool jaws while the other positions the terminal at the proper crimping area.

Address: Aircraft-Marine Products, Inc., 2100 Paxton St., Harrisburg, Pa.



Adhesive Symbols

A pre-printed adhesive tape of the pressure-sensitive variety, providing plant layout symbols has been announced by the Labelon Tape Company, Inc.

Available in either 324" or 648" rolls, in opaque or transparent types, the new tape is said to eliminate the tedious drawing of symbols and to permit instant changes in temporary layouts merely by stripping the tape from its original position and placing it in the desired location. Symbols include those for walls, aisles, conveyors, monorails, center lines, columns, shafts, stairways, service lines, tracks, and colored arrows for material and process flows, all designs scaled $\frac{1}{4}$ " to one foot.

Address: Labelon Tape Company, 450 Atlantic Ave., Rochester 9, N. Y.



Drill Point Gauge

An optically precise gauge for the inspection of drill points, called the Drill Point Chek, has been introduced by the F. T. Griswold Mfg. Co.

A hand tool, the gauge is said to detect even slight differences between lip angles or between the lengths of cutting edges, providing more accurate drilling and longer tool life by assuring correctly ground drill points. Accommodating any included angle of point up to 145°, the new gauge can be used with any two-tip drill whether straight shank or taper, right or left hand, from No. 80 up to one inch.

Address: F. T. Griswold Mfg. Co., Devon, Pa.

TESTING TOPICS



GREER AIRCRAFT ALTERNATOR LOAD BANK, above, is used to test load 120/205, 400 cycle, three phase alternators. Loads can be balanced or unbalanced, resistive or reactive as required. Greer's electrical test stands will check all systems—from 110 volt, single phase to 400 cycle, 3 phase, both A.C. and D.C.

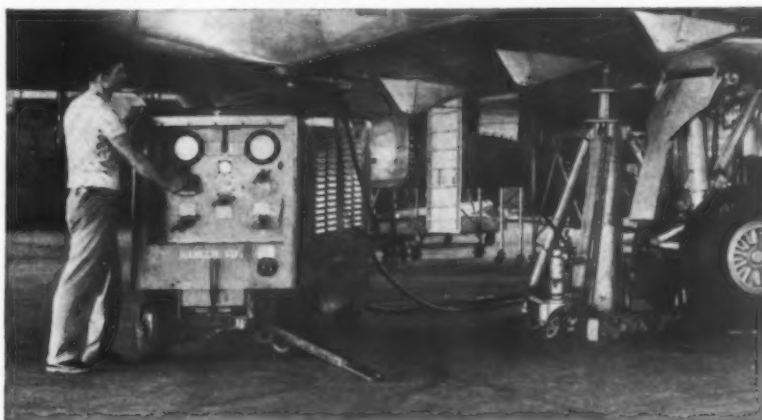
Greer Testers Check Martin 404

Like other aircraft builders, Glenn L. Martin counts on Greer accuracy for precision testing operations

Why do so many aircraft manufacturers, so many airlines, pick Greer test machines for checking crucial components? Is it Greer accuracy? Dependability? Experience? It's all of these, of course, and more. Greer points to an unequalled record for service to the industry; a reputation that guarantees complete satisfaction; a list of customers reading like a "Who's Who" of the aviation world.

Pioneers in test equipment, Greer has more recently aroused industry-wide interest by furthering the stan-

dardization of test equipment. A study of the Greer catalog (yours for the asking) will reveal a remarkable selection of standard units for a great variety of testing jobs. Greer's staff of creative engineers is capable of solving any out-of-ordinary requirements.



GREER PORTABLE HYDRAULIC TEST MACHINE, above, is shown testing the Martin 404 airliner. This test machine provides hydraulic fluid to 3400 psi pressure and at flow rates to 20 gpm for checking hydraulic system of modern aircraft on flight line. Photographs courtesy of The Glenn L. Martin Company.

Greer Hydraulics Inc. • 454 Eighteenth St., Brooklyn 15, N. Y.

Field Offices: 298 Commercial Bldg., Dayton • 2832 E. Grand Blvd., Detroit • Representatives in all principal cities



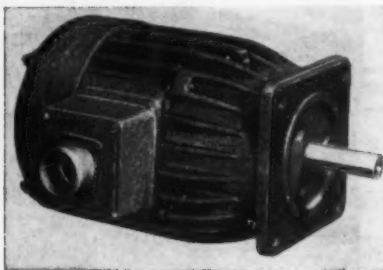
Portable X-ray

A portable X-ray unit for industrial applications is marketed by Holger Andreasen Inc., under the trade name, Andrex.

Featuring containment of the X-ray tube and other high tension parts in one single all-welded steel tank, the Andrex unit is available in capacities of 120 and 175 kVp.

Elimination of high-tension cables, cooling connections, separate transformers and cooling pumps permits the unit to be carried by one man into working areas formerly inaccessible, according to the manufacturer.

Address: Holger Andreasen, Inc., 703 Market St., San Francisco, Calif.



Aircraft Motors

Explosion-proof aircraft motors in two types have been introduced by U. S. Electric Motors, Inc.

Unit shown, of the multi-speed type with a d-c actuated brake, is rated at 1/3 hp at 11,000 rpm and 1/4 hp at 5200 rpm. Operating from 400-cycle, 3-phase a-c current, the new motor is double enclosed with fan blast being directed over the heat-dissipating fins for maximum cooling. Features include pre-packed ball bearings, explosion-proof construction, moisture resistant AN connector, thermol overload

protection, two speed windings, high torque, and rapid acceleration.

Another new model rated at 1 1/2 hp is of the geared type, is designed for continuous duty applications, and also operates from 400-cycle, 3-phase alternating current.

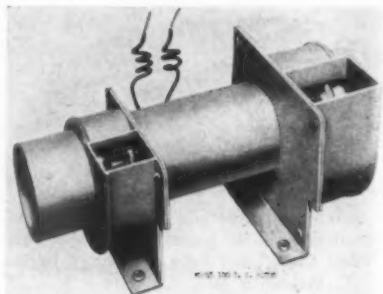
Address: U. S. Electrical Motors, Inc. Aircraft Division, Terminal Annex (Box 2058), Los Angeles 54, Calif.



Coupling Valve

A self-sealing coupling valve conforming to specification MIL-N-5877 for use in aircraft refueling can be connected and disconnected under pressure without loss of fuel, according to the manufacturer, the Buckeye Iron & Brass Works. Used for bottom loading of tank trucks or with hydrant systems, the new valve delivers 600 gpm at 50 psi line pressure, with a pressure drop through the valve of only 5.25 psi. Opening automatically when connected, the new Buckeye valve is available in a 2 1/2" size with either 2 1/2" or 3" inlet.

Address: Buckeye Iron & Brass Works, Dayton, Ohio.



Blower

A fractional hp blower for cooling aircraft electronic equipment has been introduced by the EMC Division, Howard Industries, Inc. Rated at 1/50 hp at 27 1/2 volts, the model 100 blower operates at 4500 rpm at sea level, 6500 rpm at 50,000 feet, and is said to provide a relatively constant air delivery of 40 cfm.

Address: EMC Division, Howard Industries, Inc., 1760 State St., Racine, Wisconsin.



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Airline Commentary

By Eric Bramley



THE MEETING of the traffic conferences of the International Air Transport Association in Cannes, France, which we attended, finally ended at six o'clock Thanksgiving morning after an all-night session. The meeting lasted 37 days, and the delegates from 47 airlines were wondering whether they would ever see their native lands again. Of course, when you're trying to decide on dates and conditions for worldwide tourist service, plus setting regular fares for a year ahead, it takes time. Incidentally, in the process of preparing resolutions, listing fares, and issuing other documents, the conference used up five tons of paper.

As is the case with all such lengthy conferences, humorous documents started to appear. One was in the form of a press release, under a Cannes dateline of April 1, 1953. It stated: "Twenty bearded and emaciated survivors of the . . . conference staggered blinking into the spring sunshine of the fashionable French resort this morning when workmen removed the winter boardings from the doors and windows of the Hotel Martinez. Behind them, in the sinister silence of the great hotel, they left 80 colleagues who failed to survive the winter-long ordeal."

Another conference communique noted that the "International Red Cross agreed today to study the possibility of arranging for food parcels for conference delegates under the prisoners-of-war scheme." Another item stated that "the public relations office has developed a set of form letters for wives who can't understand what delegates have been doing here for so long." And a third revealed that "representatives of several airlines have demanded that their companies establish a rotation policy for conference personnel."

Coincidence of the year: The 1953 calendars of TWA and Pan American World Airways show the same scene for the same month. On both calendars the illustration for the month of June, 1953, is Neuschwanstein castle in Germany. They're different shots, of course, but it's the same building.

While in Paris, we visited the Gare des Invalides—the equivalent of Airlines Terminal in New York—and noticed a new arrangement of handling baggage. As shown in the accompanying photo (taken for us by Air France), it consists of sets of rollers at each ticket position. You dump your bags on the rollers and get into the check-in line. As you progress, it's easy to roll your baggage along to the scales, shown in the background. It doesn't show too well in the photo, but the rollers send the bags right onto the scales. This eliminates what we've seen at some U. S. terminals, where baggage is lined up off the floor when a heavy trip is checking in. Every time you move up in the line, you have to pick up your bags and move them one position. We thought the French idea had considerable merit, and were wondering why it couldn't work at an airport as well as at a downtown terminal. Also, not shown in the photo, there are railings which guide you into the agent's position. You go in on one side of the railing and come out on the other. It's impossible to bunch up at the counter. Darned good traffic control.



People

ADMINISTRATIVE

Hugh Lehnacker and **Julius Kendall** have recently been elected vice presidents of Greer Hydraulics, Inc. Lehnacker, a director of the corporation, will continue in charge of production; Kendall, in addition to his duties as general sales and service manager, will direct the research and development activities of the concern.

George R. Hill, comptroller of the Curtiss-Wright corporation since 1949, has been elected a vice president of the concern. Hill will continue to serve as comptroller in addition to his new duties as vice president.



Fontaine



Hill

A. P. Fontaine has been appointed to the executive staff of Bendix Aviation Corp. as staff assistant. Fontaine, previously with Bendix in 1944-46, was recently vice president and general manager of Consolidated Vultee Aircraft Corp.

Joseph B. Rice, Jr., currently vice president and director of Lebec Chemical Co. and Pomar Corp. will become general manager and chairman of the board of Beckman & Whitely, Inc., San Carlos, California.

V. A. Kropff, assistant to the president of Mid-Continent Airlines before its merger with Braniff Airways, has assumed his new duties in Dallas as assistant to **Charles E. Beard**, executive vice president of Braniff.

Norton H. Jonathan has been appointed to the post of director of publicity for Ozark Air Lines. Prior to joining Ozark, Jonathan was assistant to the director of publicity for Mid-Continent Airlines.

Karl V. Kaylos, Pan American World Airways, has been named division accountant for the carrier's Latin American Division.

O. E. Wilkinson has been appointed staff assistant-union contracts for United Air Lines. Wilkinson will make his headquarters at the company's Denver operating base.

John Muchmore, recently personnel manager with Hughes Aircraft Co., has joined AResearch Manufacturing Co., Los Angeles, as staff assistant to **C. W. Reynolds**, director of public relations.

ENGINEERING

Edgar Schmued has been appointed vice president in charge of engineering of Northrop Aircraft, Inc. Schmued, as head of Northrop's engineering and design activities, will fill a position vacated by the recent retirement of **John K. Northrop**.

William T. Stephens has joined The Parker Appliance Co. as staff engineer. In his new post, Stephens will have charge of the company's development program for industrial hydraulic equipment.



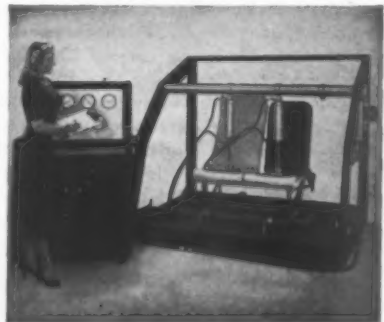
New Officers and directors elected at tenth annual meeting of Aviation Distributors and Manufacturers Association. Front row: **James Riddle**, vice president; **L. W. Trees**, president; **L. F. Zygmunt**, vice president. Back row: **L. J. Bollo**, director; **R. G. Diehl**, director; **H. Donald Richards**, executive secretary. Directors **Horn** and **Orr** not shown.

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Northeast started operations in August, 1933, with only two secondhand, tri-motored Stinsons, three mechanics, three pilots and a total capital of \$10,000. During the 5 months of that first year, Northeast carried 1,904 passengers, flew 239,000 passenger miles. . . . Nineteen years later, during the first five-month period of 1952, Northeast carried 130,034 passengers and logged 25,042,324 passenger miles with a proud fleet of fast, dependable Convair-liners and DC-3's. . . . In the early days, the airline showed typical Yankee tenacity in its unswerving determination to bring commercial air travel to the New England area, overcoming such obstacles as airports which were merely local pasture lands staked off to show the level areas, and, except for Boston, totally lacking in radio and navigational aids, weather bureaus, or facilities for night flying. . . . As improvements were gradually brought about, Northeast Airlines grew and prospered until now its flights extend from New York to Montreal and to 33 cities in the New England states. Like other successful airlines, Northeast depends upon Bendix* Radio equipment.

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OPERATIONS-MAINTENANCE

J. W. Roche is the new assistant general superintendent of Kaiser-Frazer Corp.'s flight test department at Willow Run.

Kenneth F. Leaman has been named assistant division manager and general works manager of the Tucson Division of Grand Central Aircraft Company.



Panagra's Rolling Stones.

Arthur, Margaret, and Ernest Stone, flight attendants with Pan American-Grace Airways, are the only such flying brother-and-sister team in the aviation industry and have already chalked up nearly a million flying miles.

MILITARY

Major General Vernon E. Megee will succeed Major General Clayton C. Jerome as commanding general of the First Marine Aircraft Wing in Korea in January.



The following employees have recently completed 20 years or more of service in the aviation industry:

- J. L. Helsel, United Air Lines. Flight engineer, San Francisco. 20 years.
- Lillian Buckley, United Air Lines. Secretary, executive officer, Chicago. 20 years.
- H. J. Masters, American Airlines. Inspector, line maintenance, Los Angeles. 20 years.
- R. A. Kleiber, American Airlines. Assistant manager, reservations procedures, New York. 20 years.
- John DeStefano, American Airlines. Foreman, line maintenance, New York. 20 years.
- C. W. Herre, Trans World Airlines. Asst. to director, economic planning, Kansas City. 20 years.

AMERICAN AVIATION

PAA's LAD Blasts CAB Over Competition

A get-tough policy by CAB with respect to Pan American World Airways' increasing need for mail pay support in the Latin American area drew a blast from Pan Am last week of "excessive and, to a large extent, unregulated competition" in the area.

CAB proposed to grant an additional \$6 million to PAA on a temporary basis; half to meet increased break-even need and half on a long-term basis to alleviate Pan Am's currency situation in Brazil. But the Board expressed "deep concern" with the trend and ordered the line's management to take immediate economy steps "even though this may require a substantial reduction in the services provided."

CAB said the Latin American break-even need of Pan Am has tripled from approximately \$3.9 million as of June 30, 1951, to \$11.7 million for the year ended June 30, 1952. Board indicated this trend differed from the progress of domestic lines and cited an improving record of Pan American-Grace Airways as evidence, in its opinion, that the "deteriorating trend" of PAA's LAD break-even need "can not be attributed to inherent difficulties in South American airline operations."

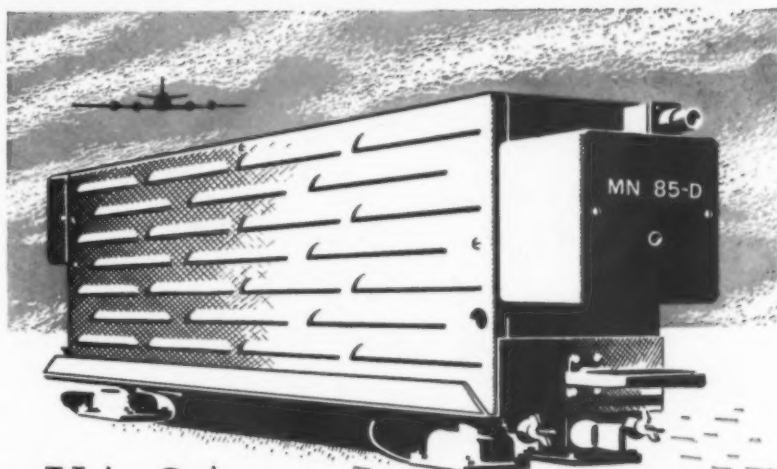
Pan Am blamed the higher need on increased American and foreign-flag competition and said the domestic lines had been able not only to achieve a much larger proportionate increase in traffic, but also to increase rates at which the traffic was carried.

Pan Am said that 60% of its increased traffic in Latin America was coach traffic to San Juan at rates sharply reduced to meet a competitor. But the carrier entered no objection to the proposed \$6 million additional mail pay and asked CAB for "prompt issuance" of an order granting the extra sum.

Pioneer Extension Approval Tentative

The Civil Aeronautics Board has concluded tentatively that Pioneer Airlines' Lubbock-Albuquerque segment should be extended, possibly until September, 1954, expiration date of other segments of Pioneer's routes. Board directed Pioneer to show cause why the extension should not be made and ordered public hearings in the near future.

Proposal is expected to get no opposition from Pioneer unless certain changes in the segment are sought. The



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carrier had previously applied to CAB for renewal of the segment which bore an expiration date of September 30, 1952, but remained effective pending disposition of the renewal bid.

Air Traffic Overshadows Pullman, Sets Record

Air traffic exceeded Pullman traffic by over 1½ billion revenue passenger-miles during the first eight months of 1952, according to an AMERICAN AVIATION study. For the comparable 1951 period, Pullman travel was nearly one billion passenger-miles ahead of air, but by the end of the year the trend toward air predominance was asserted.

Through August, 1952, domestic airlines had operated 8.2 billion revenue passenger-miles as compared to 6 billion for the same period in 1951. Pullman meanwhile declined from 6.9 billion in 1951 to 6.6 billion through August of this year.

As far as revenue was concerned, the airline industry continued to penetrate the over-all market. In the first six months of 1951, revenue from passenger air travel amounted to 72.7% of rail, but for the same period this year, it stood at 78.1%.

In regard to dollars, the rails took in \$414,769,097 through June, 1952, while airline domestic passenger revenue was \$324,295,322.

AS OF NOW

Five airlines are in the running for a New York-Cleveland non-stop route authorization to compete with present service of United Air Lines between the points. Number was increased recently when CAB decided that portions of pending route applications of Colonial and TWA fell within the scope of the NEW YORK-CLEVELAND NON-STOP CASE.

Previously, American, Capital (which now operates the route under an exemption), and Northwest were named as parties. Case is expected to go to hearings early in 1953 with a decision possibly by Spring.

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WIGGINS AIRWAYS is still fighting its renewal battle with the Board. Although CAB decided against renewal and ordered termination of Wiggins' operations by January 1, 1953, the carrier

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has petitioned for reversal of the order and will continue operating at least until CAB acts on that petition.

On the other end of the local line renewal scene, the **BONANZA CERTIFICATE RENEWAL CASE** will soon get underway. Bonanza's certificate expires December 31, 1952, but operations will continue until a Board decision on the renewal bid. Proceeding may be stretched out, however, to permit development of traffic and financial information relevant to Bonanza's new service from Phoenix to the west coast.

Several other important issues may become involved in the case. One is a renewal of the Western-Bonanza fight over service to Yuma and El Centro, and the other, activation of a Bonanza-Southwest merger investigation instituted by CAB in January, 1952.

Concern is growing over the impact of ocean-van services on the Seattle-Alaska freight market and hearings in the **PACIFIC NORTHWEST-ALASKA TARIFF INVESTIGATION**, completed in October, have been reopened to weigh new evidence. Reportedly delving into the market, the ocean-van operations may, according to CAB Examiner Paul N. Pfeiffer, require lower instead of higher air freight rates in the area. Also, this could lead to an increase in passenger fares to support the Alaskan air freight business.

RECENT CAB DECISIONS

• Seaboard & Western Airlines denied request for decision on trans-Atlantic cargo route application on basis of established record; further hearings to be held.

• Riddle Aviation's U.S.-Puerto Rico all-cargo certificate reissued to reflect change in corporate name to Riddle Airlines, Inc., effective December 13.

• Aerovias Sud Americana's airport notices approved for scheduled all-cargo service to Belize, Bogota, Guatemala City, Havana, and San Salvador.

CAB CALENDAR

Dec. 29—Hearing in Caribbean American Lines Enforcement Proceeding. Washington, D. C. (Docket 5657).

Jan. 6—Hearing resumed in United Air Lines Route No. 1 Restriction Case. Washington, D. C. (Docket 2190).

Jan. 6—Hearing in Reopened Southern Service to the West Case. Washington, D. C. (Docket 1102 et al).

Jan. 6—Hearing in Air America, Inc., Enforcement Proceeding. Washington, D. C. (Docket 5766).

Jan. 12—Hearing in California Air Coach Fares Investigation. Tentative. (Docket 5608).



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DECEMBER 22, 1952

57

U. S. Domestic Airline Traffic for August, 1952

AIRLINES	REVENUE PASSENGERS	REVENUE PASSENGER MILES	AVAILABLE SEAT MILES	PASSENGER LOAD FACTOR	MAIL TON-MAILES	EXPRESS TON-MAILES	FREIGHT TON-MAILES	TOTAL TON-MAILES	REV. TRAFFIC	AVAILABLE TON-MAILES	% AVAILABLE TON-MAILES	REVENUE PLANE-MILES	SCHEDULED MILES	% SCHEDULED MILES COMPLETED
All American	20,731	3,013,000	6,291,000	47.90	5,576	8,879	...	309,489	718,915	43.05	299,548	293,515	97.44	
Braniff	4,670	1,096,000	2,596,000	42.21	1,687	1,472	2,245	110,274	261,469	42.17	112,961	114,266	98.86	
Capital	2,465	478,000	1,028,000	46.50	884	1,086	1,578	49,148	102,790	47.81	42,829	42,919	99.79	
Continental	4,708	640,000	3,217,000	19.89	3,367	877	1,931	64,488	367,692	17.54	153,205	156,760	96.38	
Frontier	13,042	3,485,000	8,550,000	40.76	9,510	5,578	37,937	403,213	816,226	49.40	408,052	404,054	99.76	
Lake Central	3,197	501,000	1,821,000	27.51	1,164	3,509	...	50,464	207,855	24.28	90,679	90,924	99.73	
NCA**	2,426	484,000	994,000	48.69	843	750	1,702	49,475	99,438	49.76	41,424	40,920	99.77	
Robinson***	11,598	1,990,000	4,813,000	41.35	3,013	4,982	3,220	189,331	446,947	42.36	200,352	193,927	98.35	
Southwest	8,663	1,438,000	5,807,000	24.76	3,821	5,687	...	144,056	509,815	28.26	232,262	232,908	98.80	
Piedmont	23,257	5,176,000	9,886,000	52.36	7,798	8,372	13,894	525,183	1,129,788	46.49	470,745	469,818	99.68	
Pioneer	16,008	4,390,000	11,258,000	38.99	10,662	3,433	15,213	448,523	1,094,254	40.98	312,721	322,669	96.73	
Southern	10,701	1,827,000	6,208,000	29.43	6,436	6,157	...	187,483	671,828	27.91	295,635	293,446	98.93	
Southwest	16,918	3,244,000	5,508,000	58.90	7,760	4,031	11,126	332,163	629,527	52.76	262,303	260,851	99.08	
Trans-Texas	15,046	2,433,000	4,991,000	35.68	5,279	3,057	5,402	180,187	559,003	32.23	232,918	226,338	100.00	
West Coast#	388	37,000	4,916,000	49.49	2,475	3,695	...	229,266	518,528	44.21	235,916	235,259	98.54	
Wiggins	17,774	3,053,000	6,296,000	48.49	8,949	12,129	...	311,742	719,512	43.13	299,797	303,521	97.80	
TOTALS	178,879	35,030,000	84,228,000	41.59	79,335	72,650	97,943	3,588,136	8,869,402	40.45	3,730,116	3,734,042	98.39	
Helicopter Mail Service														
HAS	...	...	...	...	2,641	...	...	2,641	7,278	36.29	35,566	35,828	99.21
Los Angeles	...	...	...	...	3,300	...	...	3,300	8,575	38.48	20,503	23,405	87.60
Figures for NCA Not Previously Reported														
NCA (July)	4,646	966,000	2,088,000	46.26	2,085	2,054	2,745	99,040	208,783	47.44	86,993	84,568	99.94	
* Figures are for period from August 16-31 and cover operations of local service route 106 now operated by Braniff Airways as result of Braniff-Mid-Continent merger, effective August 16.														
** Figures are for period from August 1-15 and cover operations of local service route 106 (see above footnote).														
*** Formerly Robinson Airlines Corp. Change in name was effective August 23, 1952, per CAB order E6689.														
# Merger between West Coast Airlines and Empire Air Lines was effective August 1, 1952, West Coast being the surviving company.														

U. S. Domestic Airline Traffic for September, 1952

AIRLINES	REVENUE PASSENGERS	REVENUE PASSENGER MILES	AVAILABLE SEAT MILES	PASSENGER LOAD FACTOR	MAIL TON-MAILES *	EXPRESS TON-MAILES	FREIGHT TON-MAILES	TOTAL TON-MAILES	REVENUE TRAFFIC	AVAILABLE TON-MAILES	% AVAILABLE TON-MAILES	REVENUE PLANE MILES	SCHEDULED MILES	% SCHEDULED MILES COMPLETED
American	484,276	268,094,000	346,926,000	77.28	1,305,906	812,814	3,832,478	31,519,596	45,384,526	69.45	7,997,510	7,564,249	99.20	
Braniff	Figures not yet available.	Data will be reported later.												
Capital	191,439	61,323,000	100,273,000	61.16	146,920	227,999	377,633	6,615,171	13,221,670	50.03	2,304,953	2,250,458	98.99	
Caribair	7,653	608,000	1,387,000	43.84	795	1,521	5,714	52,734	135,110	39.02	52,290	48,610	99.18	
C & S	47,446	17,847,000	27,926,000	63.91	67,436	86,814	111,070	1,976,482	3,415,146	57.87	823,011	818,196	99.77	
Colonial	28,249	7,041,000	12,774,000	55.12	9,719	10,635	15,608	725,938	1,361,123	53.33	373,146	368,007	99.21	
Continental	32,179	12,513,000	20,236,000	61.18	36,711	16,514	70,682	1,323,402	2,338,238	56.60	655,660	652,767	99.29	
Delta	78,541	32,883,000	53,391,000	61.59	137,753	98,513	372,852	3,765,340	6,416,150	58.69	1,433,004	1,410,097	99.88	
Eastern	330,785	150,783,000	281,552,000	53.55	440,724	378,061	591,402	16,675,326	35,805,199	46.57	5,125,312	5,485,830	99.49	
Hawaiian	27,549	3,673,000	6,908,000	53.17	2,020	1,000	100,879	407,185	858,395	47.44	325,927	262,801	99.61	
National	46,826	29,713,000	49,558,000	59.96	93,125	33,114	429,128	3,581,369	6,235,775	57.43	1,161,226	1,170,588	98.99	
Northeast	46,912	9,610,000	15,646,000	61.42	12,541	15,726	27,449	926,081	1,667,645	55.53	498,129	473,697	98.27	
Northwest	89,033	62,198,000	89,203,000	69.73	271,830	157,934	309,597	6,704,201	10,491,133	63.90	1,602,821	1,605,812	99.25	
Trans Pac.	12,908	1,725,000	4,320,000	39.93	1,457	105	6,550	144,721	376,571	38.43	154,724	136,240	99.66	
TWA	229,028	183,152,000	229,505,000	79.80	820,079	532,375	1,382,983	20,260,102	28,792,427	70.37	4,858,339	4,838,988	99.43	
United	343,833	229,229,000	286,840,000	79.92	1,637,643	858,866	2,496,918	26,970,937	44,993,262	62.73	6,489,587	6,431,767	99.46	
Western	70,288	27,485,000	39,480,000	69.62	95,348	47,673	83,902	2,852,665	4,254,188	67.06	1,066,627	1,069,107	99.32	
TOTALS	2,068,945	1,097,877,000	1,565,925,000	70.11	5,080,007	3,276,603	10,210,652	124,501,230	203,746,558	61.10	34,321,676	34,567,234	99.34	
* Includes air parcel post.														
NOTE: Figures include both scheduled and non-scheduled operations.														

U. S. Domestic Airline Revenues and Expenses for Quarter Ending Sept. 30, 1952

AIRLINES	TOTAL OPERATING REVENUES	PASSENGER REVENUES	MAIL REVENUES	EXPRESS REVENUES	FREIGHT REVENUES	EXCESS BAGGAGE REVENUES	NON-SCHEDULED TRANSPORT REVENUES	TOTAL OPERATING EXPENSES	AIRCRAFT OPERATING EXPENSES	GROUND & INDIRECT EXPENSES	NET OPERATING INCOME	NET INCOME BEFORE TAXES
American	\$ 49,884,659	\$ 43,905,518	\$ 1,771,706	\$ 866,709	\$ 2,320,089	\$ 483,145	\$ 246,879	\$ 39,748,560	\$ 20,582,982	\$ 19,165,578	\$ 10,136,099	\$ 10,136,099
Braniff	6,504,824	5,718,098	369,399	97,795	166,175	52,767	45,819	5,727,725	2,871,110	2,856,615	777,099	777,099
Capital	11,420,746	10,396,598	231,624	256,924	236,011	63,666	105,466	10,178,796	5,016,842	5,161,954	1,241,950	1,241,950
Continental	289,003	223,157	39,204	...	7,775	1,558	7,905	269,409	110,757	158,652	19,594	19,594
C & S	3,664,486	3,176,105	272,102	90,023	85,489	23,068	7,049	3,271,843	1,610,120	1,661,723	392,643	392,643
Colonial	1,553,397	1,381,999	127,676	11,432	15,816	9,721	2,042	1,504,618	662,016	842,602	48,779	48,779
Continental	2,670,932	2,368,874	170,687	20,927	53,028	18,689	16,380	2,361,826	1,231,427	1,130,399	309,106	309,106
Delta	6,553,188	5,863,057	230,768	95,156	227,020	64,174	26,881	5,813,900	2,924,782	2,899,118	739,288	739,288
Eastern	26,408,704	24,661,095	519,148	389,038	324,135	338,836	50,232	24,594,459	14,225,712	10,368,747	1,814,245	1,814,245
Hawaiian	1,312,649	1,039,261	72,226	...	169,273	20,700	3,876	1,149,334	497,487	651,847	163,135	163,135
NCA**	1,364,994	1,094,353	217,743	14,177	19,009	8,148	6,732	1,286,039	625,285	660,754	78,955	78,955
National	5,552,482	4,780,987	147,108	39,343	276,077	93,226	6,662	5,282,501	2,466,100	2,816,401	269,981	269,981
Northwest	2,658,130	2,225,196	300,564	23,963	39,563	16,847	21,135	2,243,882	1,095,430	1,148,452	414,248	414,248
Northwest	11,316,048	10,059,895	410,798	148,387	266,788	80,443	4,770	9,352,524	4,997,319	4,335,205	1,807,524	1,807,524
Trans Pacific	589,775	396,457	9,208	1,611	11,882	7,506	520,042	589,775	209,550	316,492	69,733	69,733
TWA	30,636,933	27,477,316	1,050,406	549,336	822,176	237,770	40,419	25,594,387	13,728,246	11,866,141	5,402,546	5,402,546
United	42,589,493	36,876,172	2,205,566	865,052	1,470,351	348,277	389,851	31,969,801	14,769,717	17,197,084	10,622,692	10,622,692
Western	4,983,280	4,528,265	158,238	58,959	78,043	27,270	4,439	3,893,888	1,843,673	2,050,215	1,089,392	1,089,392
TOTALS	209,773,723	186,173,213	8,304,171	3,529,252	6,585,700	1,895,751	1,141,177	174,740,534	89,462,555	85,277,979	35,033,189	35,033,189

* Braniff-Mid-Continent merger was effective August 16, 1952.
 ** Figures are through August 15, 1952. Braniff-NCA merger was effective August 16.

U. S. International Airline Traffic for August, 1952

AIRLINES	REVENUE	PASSENGERS	REVENUE	PASSENGERS	AVAILABLE SEAT MILES	LOAD FACTOR	U. S. MAIL TON-MAILES	FOREIGN MAIL TON-MAILES	EXPRESS TON-MAILES	FREIGHT TON-MAILES	TOTAL TON-MAILES	REV. TRAFFIC TON-MAILES	% AVAILABLE TON-MAILES	REVENUE PLANE-MILES	SCHEDULED MILES	% SCHEDULED MILES COMP. LINES
American	10,455	7,811,000	12,683,000	61.59	14,130	4,257	481	169,482	1,008,626	1,804,601	55.89	250,448	249,648	99.90		
Braniff	3,424	7,528,000	15,381,000	48.94	30,848	5,675	...	75,850	946,749	2,128,895	44.47	349,216	371,934	93.89		
C & S	3,245	3,976,000	6,991,000	60.32	5,028	615	...	86,369	503,487	912,561	55.17	142,711	143,902	99.17		
Colonial	4,794	3,769,000	5,032,000	74.90	865	279	...	4,594	402,695	602,528	66.83	98,391	73,655	100.00		
Eastern	13,332	19,907,000	24,118,000	82.54	32,583	...	...	24,261	2,059,980	4,684,080	43.98	499,470	...	*		
National	10,839	2,806,000	3,844,000	72.94	1,277	...	...	3,743	302,949	508,176	59.61	67,536	64,976	100.00		
Northwest	9,865	16,702,000	25,729,000	64.92	103,981	33,018	19,920	646,294	2,579,277	3,568,079	72.29	564,067	529,219	96.39		
Panagra	10,122	10,781,000	19,724,000	54.66	30,924	26,851	...	197,092	1,459,070	2,737,888	53.29	504,697	495,026	99.84		
PAA	81,022	74,638,000	109,903,000	67.91	247,704	60,133	...	1,820,207	9,136,805	14,235,216	64.18	2,438,875	1,896,295	96.32		
Latin Amer.	47,807	70,720,000	104,173,000	67.89	457,117	111,334	...	910,944	9,013,832	13,247,126	68.04	1,744,056	1,782,910	93.38		
Atlantic	9,428	33,527,000	45,522,000	73.65	349,573	70,298	...	515,932	4,597,440	7,666,904	59.96	926,026	901,009	99.99		
Pacific	8,567	10,022,000	15,114,000	65.44	42,490	...	...	564,073	1,643,080	2,498,992	65.75	376,307	307,466	99.99		
Alaska	19,801	51,569,000	65,726,000	78.46	312,699	142,075	...	553,631	6,501,227	8,966,925	72.50	1,413,678	1,412,722	97.39		
TWA	5,351	13,247,000	14,810,000	89.45	65,836	...	...	52,915	1,511,850	2,083,220	72.57	279,750	265,350	100.00		
United																
TOTALS	238,052	327,001,000	463,550,000	69.79	1,695,055	454,535	24,144	5,635,747	41,667,067	65,645,191	63.47	9,655,228	8,494,112	96.83		

* Not available.
** Includes air parcel post.

NOTE: 1. Figures include both scheduled and non-scheduled operations.
2. Data in above tabulations were compiled by American Aviation Publications from monthly reports filed by the airlines with the Civil Aeronautics Board. Figures for American Airlines include that carrier's service to Mexico but not to Canada; for Braniff to South America; C & S to South America; Colonial to Bermuda; Eastern to Puerto Rico; National to Havana; Northwest to Orient and Honolulu, and United to Honolulu. Operations of U.S. carriers into Canada are included in domestic reports to CAB, in accordance with CAB filing procedures.

U. S. International Airline Traffic for September, 1952

AIRLINES	REVENUE	PASSENGERS	REVENUE	PASSENGERS	AVAILABLE SEAT MILES	LOAD FACTOR	U. S. MAIL TON-MAILES	FOREIGN MAIL TON-MAILES	EXPRESS TON-MAILES	FREIGHT TON-MAILES	TOTAL TON-MAILES	AVAILABLE TON-MAILES	REVENUE	PLANE-MILES	SCHEDULED MILES	% SCHEDULED MILES COMPLETED
American	10,381	8,044,000	12,161,000	66.15	14,139	3,846	431	150,084	1,019,896	1,661,282	61.39	235,274	236,281	99.57		
Braniff	2,695	3,690,000	6,369,000	57.93	4,676	674	...	87,378	479,520	881,861	54.38	137,927	139,260	99.04		
C & S	3,722	2,918,000	4,133,000	70.60	1,579	400	...	5,739	316,635	495,026	63.96	80,661	66,611	100.00		
Eastern	8,442	12,338,000	21,714,000	56.82	35,261	...	...	36,565	1,319,532	3,372,584	39.12	355,366	*	*
National	8,407	2,188,000	3,584,000	61.05	1,186	...	...	15,069	242,902	478,034	50.81	63,350	62,880	100.00
Northwest	7,430	12,992,000	20,670,000	62.85	90,749	33,748	16,550	563,638	2,092,886	3,039,018	68.87	475,978	490,955	91.15		
Panagra	10,749	10,917,000	19,079,000	57.22	27,688	27,259	...	174,216	1,435,640	2,659,521	53.98	495,710	483,185	99.31		
PAA	62,628	63,898,000	101,962,000	62.67	231,867	56,304	...	1,934,450	8,345,174	13,064,949	63.87	2,259,189	1,796,516	97.04		
Latin Amer.	45,523	70,010,000	101,865,000	68.73	481,801	109,547	...	1,125,401	9,168,248	13,748,436	66.69	1,754,130	1,751,066	97.47		
Atlantic	8,504	30,053,000	42,510,000	70.70	304,218	66,415	...	562,099	4,219,426	7,168,500	58.86	857,049	862,385	99.30		
Pacific	8,493	8,232,000	14,834,000	55.49	35,802	...	...	523,097	1,424,008	2,262,833	62.93	333,029	286,806	99.36
Alaska	18,465	48,020,000	63,449,000	75.68	278,429	146,375	...	705,753	6,253,301	8,734,239	71.60	1,393,504	1,379,022	98.73		
TWA	4,308	10,674,000	13,229,000	80.69	64,552	...	...	50,816	1,248,581	1,783,478	70.01	250,970	253,370	99.05
United	199,747	283,974,000	425,559,000	66.73	1,571,947	444,568	19,743	5,934,305	37,565,749	59,349,781	63.29	8,692,137	7,808,337	97.77		
TOTALS																
	* Not available.															
	** Includes air parcel post.															
NOTE	1. Figures include both scheduled and non-scheduled operations.															
	2. Data in above tabulations were compiled by American Aviation Publications from monthly reports filed by the airlines with the Civil Aeronautics Board. Figures for American Airlines include that carrier's service to Mexico but not to Canada; for Braniff to South America; C & S to South America; Colonial to Bermuda; Eastern to Puerto Rico; National to Havana; Northwest to Orient and Honolulu, and United to Honolulu. Operations of U.S. carriers into Canada are included in domestic reports to CAB, in accordance with CAB filing procedures.															

U. S. International Revenues and Expenses for Quarter Ending Sept. 30, 1952

AIRLINES	TOTAL OPERATING REVENUES	PASSENGER REVENUES	U. S. MAIL REVENUES	FOREIGN MAIL REVENUES	EXPRESS REVENUES	FREIGHT REVENUES	EXCESS BAGGAGE REVENUES	NON-SCHEDULED REV.	TOTAL OPERATING EXPENSES	AIRCRAFT OPERATING EXPENSES	GROUNDS & INDIRECT EXPENSES	NET OPERATING INCOME (LOSS)
American	\$ 1,312,677	\$ 1,099,866	\$ 18,877	\$ 27,126	\$ 536	\$ 107,654	\$ 18,128	\$ 1,365	\$ 1,370,013	\$ 741,983	\$ 628,030	\$ -57,336
Braniff	2,360,741	1,680,883	506,218	37,581	...	89,800	38,698	...	2,528,741	1,135,497	1,393,244	-168,000
C & S	1,131,207	777,976	240,836	3,415	...	75,300	24,260	...	867,562	453,598	413,964	263,645
Colonial	557,318	526,340	14,994	2,718	...	4,189	1,992	...	485,220	202,708	282,512	72,098
Eastern	2,197,860	1,742,978	45,111	...	...	19,418	23,944	365,686	1,661,984	1,103,449	558,535	\$35,876
National	496,693	475,679	1,970	...	3,831	10,351	6,334	528	579,917	185,495	388,422	-75,224
Northwest	5,442,877	3,072,121	1,216,193	157,606	17,547	751,590	27,331	...	2,165,229	2,799,120	476,109	478,528
Panagra	5,082,547	2,854,544	1,565,100	160,825	...	273,275	96,782	1,364	4,118,171	1,969,188	2,148,983	964,376
PAA	16,695,011	12,223,054	1,806,750	385,794	...	1,706,252	278,046	122,235	17,899,151	9,738,110	8,161,041	-1,164,140
Latin Amer.	21,741,826	16,196,850	3,066,600	624,224	...	1,222,163	319,789	224,194	19,350,458	9,802,878	9,547,580	2,391,368
Atlantic	10,841,317	6,615,595	2,893,745	321,112	...	764,629	94,389	90,219	9,102,799	4,937,456	4,165,343	1,738,518
Pacific	2,350,858	1,391,477	395,600	...	...	407,432	13,994	133,043	1,888,162	922,319	965,843	462,696
Alaska	15,399,957	12,794,689	816,810	796,116	...	855,694	261,919	136,593	12,701,670	6,297,146	6,404,524	2,658,287
TWA	2,270,697	2,059,182	113,673	...	...	61,360	11,029	...	2,510,895	1,492,641	1,018,254	-240,196
United	87,843,586	63,104,834	12,702,477	2,516,517	21,914	6,349,107	1,216,635	1,075,227	79,983,092	39,530,628	40,452,464	7,860,494
TOTALS												

* Mail revenues based on temporary rates.

NOTE: Data in above tabulations were compiled by American Aviation Publications from reports filed by the airlines with the Civil Aeronautics Board. Figures for American Airlines include that carrier's service to Mexico but not to Canada; for Braniff to South America; C & S to South America; Colonial to Bermuda; Eastern to Puerto Rico; National to Havana; Northwest to Orient and Honolulu, and United to Honolulu. Operations of U.S. carriers into Canada are included in domestic reports to CAB, in accordance with CAB filing procedures.

Vos of Fokker Feted in Washington

The pictures below were taken at a reception and dinner given in honor of P. J. C. Vos, managing director of Royal Dutch Aircraft Factories, Fokker, during his recent visit to the United States.



GUEST OF HONOR, P. J. Vos (left) with Wayne W. Parrish, editor and publisher of American Aviation Publications.



ADM. D. C. RAMSEY, president of Aircraft Industries Assn., (left), caught in a thoughtful moment with Gen. Jacob L. Devers (Ret.), asst. to president, Fairchild.



VOS (left) and James Ray, Sr., of Ray & Ray. At right, L. Welch Pogue.



CAA ADMINISTRATOR Chas. Horne (left) talks with CAB member Josh Lee, and J. Paul Barringer, State Dept. (right).

Dutch Govt. Gives Fokker Go-Ahead on F-27

Fokker Aircraft Co. has been given an order by the Dutch government to go ahead with the construction of two F-27 high-wing "Douglas DC-3 replacements," P. J. C. Vos, managing director, announced during a recent visit to the U. S., where he discussed details of the licensing agreements concluded earlier in the year with Fairchild Engine and Airplane Corp.

The first prototype, due to fly late in 1954, will be powered by Rolls-Royce Dart turboprops and the second by Wright Cyclone 955C9HE2 piston engines.

KLM Royal Dutch Airlines will carry out the flight testing of the planes. If a production contract is received before the flight test programs of the prototypes start, deliveries could commence early in 1956. Fairchild will probably build the F-27 only if Fokker's production is inadequate for the demand. Price of the Dutch-manufactured plane will be about \$325,000.

For training school operators requiring a plane with a higher performance than the S-11 and S-12 (Fairchild has brought these two models to the U. S. for evaluation and demonstration purposes), Fokker has designed a version of the S-12 with a retractable undercarriage, two instead of three seats, and a 240-hp Lycoming engine. Moreover, it will offer a souped-up S-14 for air forces wishing to use the jet plane for advanced training (the new model will have a Rolls-Royce Nene instead of a Derwent engine).

Short SB-3 Makes First Flight in Britain

A new British experimental plane, the Short SB 3, made its first flight at the beginning of December. It features an exceptionally thin wing with adjustable sweep back (up to 50°). The plane is powered by a Rolls-Royce Derwent turbojet and is designed for investigation into the low-speed characteristics of swept-wing types.

Italians to Get DC-6

Italian airline Linee Aeree Italiane will take delivery in February of the Douglas DC-6 it has bought from Howard Hughes. The first two of the four Convair 240's which Braniff International Airways has sold to LAI will be turned over to the Italian carrier in the same month, the remaining two aircraft in March.

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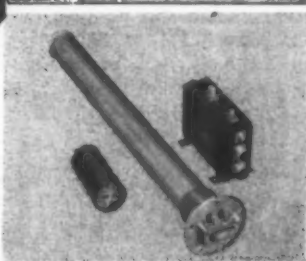


On the recent history-making Polar flight by Scandinavian Airlines which cut hours from the West Coast to Europe, fuel was a major consideration. With only two stops in the nearly 6,000 miles from San Francisco to Copenhagen, the constant accurate measurement of the Douglas DC-6B's fuel supply by the Simmonds Electronic Fuel Gage was vital to the success of this first flight.

Simmonds introduced the electronic fuel gage to American commercial airline use over ten years ago. Today more than 40 types of commercial and military aircraft are equipped with Simmonds fuel gages. The Simmonds Pacitron represents this type of gage at the highest point of refinement and reliability. The improved amplifier-bridge of the system has been reduced in weight to only 1.12 lbs. and in size to 7 1/8 inches long. It is shock-mounted internally for less bulk and greater installation ease. For the ultimate in accuracy and lightness, it's the SIMMONDS PACITRON.

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International Report



SCOTTISH Twin Pioneer, above, looks promising for bush operators.

Scotland Bids for Markets with Pioneer

THE TWIN PIONEER, Scottish Aviation's latest project, is a high-wing, twin-engine monoplane with a fixed undercarriage designed for feeder operations out of small fields. It should prove extremely useful in the Scottish isles, Alaska, the British West Indies and in similar areas.

Although in designing the Twin Pioneer, Scottish Aviation undoubtedly had in mind the home market—British European Airways badly needs new equipment for its services to the outlying Scottish isles—the aircraft's low price (\$85,000) and direct-operating costs (about 35 cents per ton-mile) make it an interesting proposition for bush-operators all over the world.

Powered by two 570-hp Alvis Leonides radials, the Twin Pioneer can cruise at up to 165 mph, yet its stalling speed is as low as 53 mph. It can take a 2,880-pound payload out of a 370-foot strip and carry this load for a stage-length of over 150 miles. With a slightly reduced payload—2,500 pounds—a stage length of 450 miles is possible.

This unusual performance range has been achieved by Scottish Aviation designers by pulling out just about all the known high-lift stops. Noteworthy are the fixed center-section slats, movable outer-wing slats, and four-section Fowler flaps extending outward to the slotted ailerons. The flaps and slats, together with the wheel brakes and windshield wipers, are hydraulically operated.

The single element tail of the model shown is being replaced by a triple tail, as used on the Constellation, to reduce

aircraft height. The cabin can seat up to 16 passengers or, in an ambulance version, nine litters can be accommodated.

Estimated performance data gives maximum take-off weight as 12,500 pounds; maximum speed, 185 mph at 2,000 feet; maximum weak-mixture cruising speed, 170 mph at 11,750 mph; minimum stalling speed, 53 mph. Length is 45.1 feet; span, 76.5 feet; and height, 13.67 feet.



PIAGGIO P.150, new Italian product.

Italian Trainer Begins Flight Tests

A new Italian trainer, the Piaggio P. 150 (see photo), recently started its flight tests. Powered by a P&W Wasp R-1340S3H1, the all-metal plane grosses 5,600 pounds and carries a useful load of 1,323 pounds. Wing loading is 20.7 pounds/sq. ft. Take-off power loading is 9.4 pounds/hp.

Maximum range at 70% power is

British Carrier Plans All-Cargo Service

A British independent airline, Hunting Air Transport, plans to start trans-Atlantic all-cargo operations to Montreal and New York next summer using Douglas DC-4's. The company hopes to buy DC-6A's or Lockheed Super Constellations later.

Airwork, another British independent, has also announced plans for similar services using British equipment. Both projects require the approval of the British government.

880 miles with 159 gallons of fuel or 585 miles with 111 gallons. Maximum speed at 5,000 feet is 237 mph. Take-off run, 705 feet; take-off distance over 50-foot obstacle, 1,280 feet. Landing run, 722 feet; landing distance (over 50-foot obstacle), 1,280 feet. Rate of climb at sea level, 1,663 feet; service ceiling, 25,200 feet.



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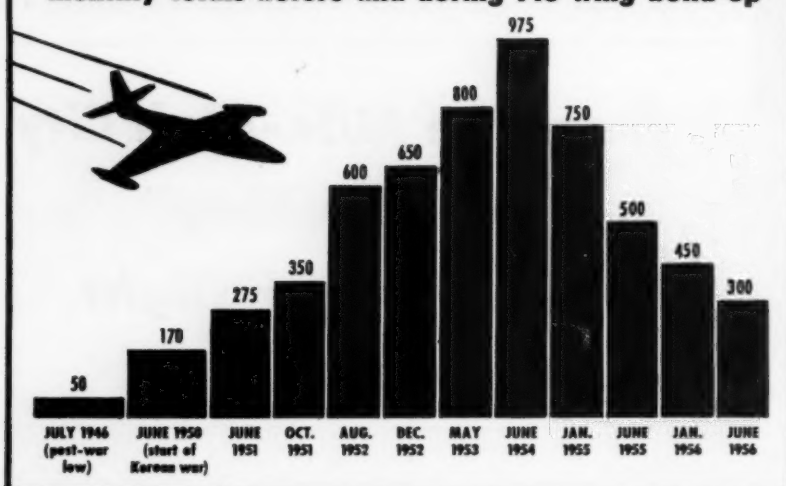
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USAF AIRPLANE DELIVERIES

monthly totals before and during 143 wing build-up



What Happens When Boom is Lowered

USAF plans for keeping industry healthy after production drops center on modifications, overhaul.

By JAMES J. HAGGERTY

THE POST-KOREA expansion of the Air Force is now at its peak, as far as contract awards for new airplanes are concerned. Plane deliveries are still on the upswing, since deliveries lag about two years behind order placement. But, barring a new emergency, the swollen backlogs of aircraft manufacturers will start to drop at the end of the current fiscal year.

Appropriations for new aircraft will drop from fiscal 1953's \$11 billion level to less than \$7 billion in the coming year. In fiscal 1955 it will drop again, probably to about \$6 billion or slightly less, where it will level off.

Some Questions

This brings up some questions:

• **What will happen to the aircraft industry when the 143-wing Air Force is attained and yearly appropriations reach the level-off plateau?**

• **How can an industry operating at the current appropriations level be maintained in later years when roughly half the dollars are available?**

• **Will the industry be permitted to deteriorate as it was allowed to in the helter-skelter demobilization following World War II?**

Not this time, according to Under Secretary of the Air Force Roswell L.

Gilpatric. The USAF is well aware that the Air Force is only as strong as the industry which backs it up. The currently-planned 143 wings is not intended to be a fighting strength; in case of war, it would have to expand rapidly, more rapidly than it did during World War II. So, looking ahead to the end of 1955, when it is expected that airframe and engine plants will be operating at production rates lower than those needed to make the most effective utilization of these plants, the USAF has drawn up plans to keep the production base from shrinking.

In brief, here are the plans, as outlined by Gilpatric:

• **Airframe manufacturers** will be assigned modification work.

• **Engine builders** will take on overhaul work.

• **"Dual plant" operations** will be maintained.

Continuing developments in aircraft accessory equipment, such as radar and armament, sometimes obsolete new planes before they roll off the production line. In several cases, new planes fresh from roll-out must be sent to modification centers for incorporation of new equipment or design changes decided upon after they started through the production line. This will be a continuing process. So, rather than open up a series of new modification centers, the

USAF reasons that the work can be handled most advantageously by the original manufacturer of the plane.

Likewise, there will be a continuing demand for engine overhaul. The USAF's own maintenance facilities are already saturated and contract companies will soon have more work than they can handle, as the increase in operating units brings on an increase in overhaul requirements. Thus, the plants of the original engine manufacturers will become additional maintenance sources.

These plans for engine and airframe manufacturers have a dual advantage: the additional work will help absorb plant overhead and at the same time permit manufacturers to retain a large portion of their work force and keep their plants at a higher degree of readiness for emergency expansion.

"Dual Plant"

The "dual plant" program involves the new companies which were brought into the production program to "broaden the base." A company which is now building refrigerators and jet engine components side by side would normally revert to refrigerator production when the 143-wing Air Force is attained. But the USAF wants to keep that additional emergency expansibility, so it plans to do all it can to keep those companies in military production. Such production will probably be at a reduced rate, but nonetheless the tool lines will be kept intact and production equipment kept in use against the day when it may be needed in a hurry.

This will have the added advantage of keeping machine tools in use, rather than shipping them to storage centers where they would deteriorate, as happened after the last war. The Air Force owns approximately 150,000 units of machine tools and major items of production equipment, all but 10% of which are now in use.

Gilpatric also cited production figures to illustrate the trend of aircraft deliveries as the 143-wing program mounts to its peak and levels off. In November, the Air Force took delivery on some 666 planes with an aggregate weight of about 8,000,000 airframe pounds. By late spring of 1953 the rate will reach 800 planes a month. The peak in terms of airframe weight will come about a year later—over 12,000,000 pounds (Gilpatric did not mention the unit figure, but the weight would indicate close to 1,000 planes).

This level will continue until mid-1954, when the "taper-off" starts. Production will drop to 500 planes a month by mid-1955 and 300 a month by June 1956.

Production Spotlight

Lifting of Engineer Salary Controls Felt

One change voted by Congress when it renewed the Defense Production Act last June—lifting of all salary controls on professional engineers—is making itself felt. At least two aircraft companies, Douglas and Lockheed, are having trouble getting new contracts signed with engineering personnel.

The Southern California Professional Engineers Association, which handles bargaining for engineers at Douglas plants in Long Beach, Santa Monica, and El Segundo, has turned down a company offer of 6%, which is proportionate to the wage boost recently given to hourly employees and all other salaried workers.

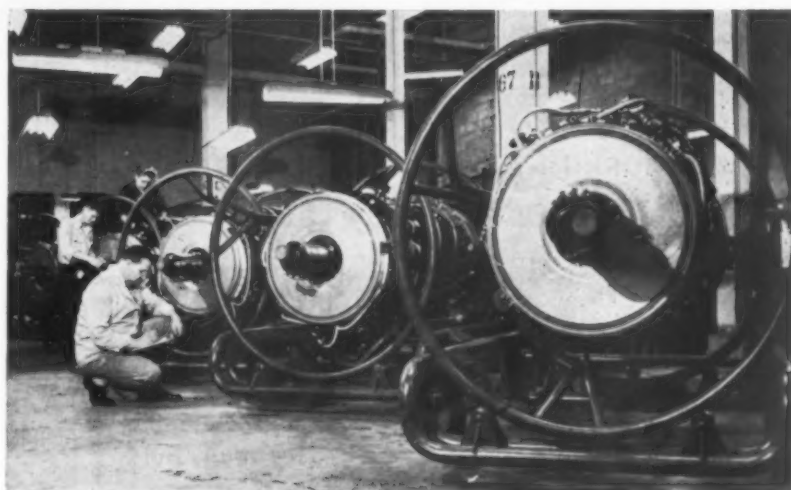
SCPEA, an unaffiliated union and professional society whose only other Los Angeles area chapter is at the Southern California Gas Co., originally demanded 20% but has lowered its request to 12%. It has asked for Federal mediators to intervene.

At Lockheed, where engineering personnel are represented by the Engineers and Architects Association—Independent, the contract does not expire until 1953 but is currently reopenable on wages and vacations. EAA is seeking a 10% boost while Lockheed has offered the same 6% it gave its production workers. Here, too, negotiations have bogged down and mediation has been requested.

USAF Accepts First Republic F-84F

First Republic F-48F Thunderstreak, swept wing version of the F-84 Thunderjet, has been accepted for the Air Force by USAF Under Secretary Roswell L. Gilpatric. The F is equipped with a Curtiss-Wright J-65 Sapphire engine rated at 7,200 pounds thrust.

Meanwhile General Motors Corp., which is also slated to produce the "F," at Kansas City, has awarded Norge Aircraft division of Borg-Warner Corp. a contract to produce parts for the Thunderstreak. Production of sub-assemblies will start immediately at Norge's Muskegon, Mich., plant.



J65 Sapphires, rated at 7,200 pounds thrust, are now coming off the assembly line at Curtiss-Wright's Wright Aeronautical Division plant, less than a year after the first USAF order. The J65 is destined for use in the Republic F-84F, Martin B-57A, and North American FJ-3.

British Aircraft Affected by Cutback

Great Britain's decision to cut back its entire defense production program will mean a substantial reduction of aircraft output. Prime Minister Winston Churchill indicated current model production would be reduced while greater emphasis is placed on introduction of more advanced military aircraft.

Reason given for the decision to reduce British defense output was the continuing financial strain. Churchill pointed out that when Britain signed the North Atlantic pact, it made its scheduled arms production contingent on its own financial condition.

NAA Adds Skin Mills To Speed Production

In an effort to speed production of wing grids and sculptured wing skins, North American Aviation has started adding a series of new skin mills. First one, an A-72 Onsrud grid and skin mill combination machine having a 30 by 6 foot bed was placed in operation late in November.

Others to be delivered next year include a Giddings and Lewis with a 24 foot table and 80 inches between

the motor cross rail supporting housings, two G. A. Gray Co. machines with 24 feet tables and 85 inches between housings, and a G & L with a 30 foot table and 104½ inches between housings.

Engine Shortage Delays F-86D Production

Continuing shortage of General Electric J47-17's and other factors are holding up delivery of about 200 North American F-86D all-weather interceptors to the USAF. The planes are currently on the field at the NAA plant at Los Angeles International Airport. In addition to the engine shortage, the delay is resulting from problems encountered in the electronic engine controls on the J-47, plus the necessity for rework of some of the radar equipment.

C-124C Changeover Expected in One Month

Early next year, possibly by the end of January, Douglas Aircraft expects to finish changing over from the C-124A Globemaster II to the C-124C. The "C" will be equipped with Pratt & Whitney R-4360-63 engines developing 3,800 horsepower (wet) for take-off, while the "A" uses R-4360-20W power plants producing 3,500 hp.

The North American FJ-2 "FURY,"
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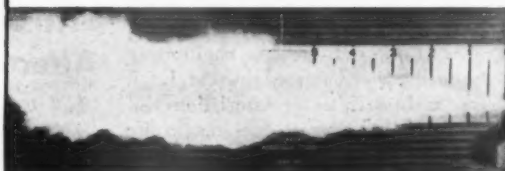
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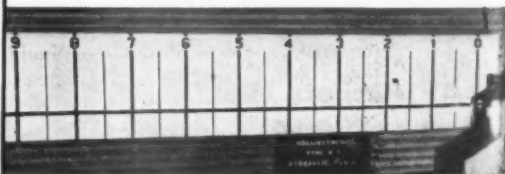
COST—H₂ is the lowest cost non-inflammable fluid available today. Although it is higher in cost than the extremely inflammable petroleum fluids, the obvious advantage is more than worth the difference.

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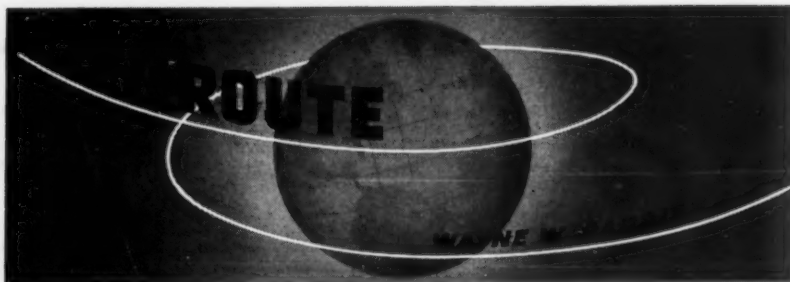
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Inside Story. Ever since that SAS flight from California to Europe via the polar regions last month, I've been greeted with such as "What's it like to fly over the North Pole?" By the tone of the questions I realize that I'm expected to divulge all the secrets of hardship that go with polar explorations.

It was really rough, friends, really rugged. I've finally decided to break down and let you in on what a 1952 polar expedition is really like. I'm lucky to be here to explain it all. It was torturous, treacherous, adventuresome. Even the memories of the hardships are painful to recall, but the readers of this page are not to be denied the bare truth.

1. It took months of planning to dress properly for this pioneering flight to the far north. I finally decided to make one concession. In addition to the sports coat and slacks I always travel in, I added a sweater. I don't know why, since the airplane was comfortably heated. But I thought I ought to add something to my usual attire; after all we were pioneering.

K Rations. 2. We were virtually on a starvation diet the whole way. I believe there was actually one two-hour stretch when no food or drink was being served. I can't complain about the steaks, because they were just right (free ad to Skychef), and the steward did such things as add sherry to the asparagus soup to give it that extra touch.

But can you imagine SAS running out of wine between Greenland and Norway? The hardship caused by this critical shortage was appalling. Just because the champagne, schnapps, and cognac didn't run out is no excuse for a wine shortage up in the Arctic. What kind of polar expedition was this, anyway?

3. I could tell you a lot about those frozen Arctic wastes. I sure could. If I had seen them, that is. But it was dark almost the entire way. Ever look out of an airplane window in pitch darkness while crossing the ocean? Must be about the identical experience. So you're not going to get any vivid descriptions out of me. Anyway, I slept a lot of the time.

4. The trip was full of impositions which caused untold suffering to us pioneers. For example at Thule, Greenland, we had to walk fifty feet from the airplane steps to the bus. So the bus was warm, they could have brought it closer than fifty feet, couldn't they? Or they could have had a heated canopy. You'd have thought we were up in Greenland somewhere the way we had to suffer. But I'll break down and say I know of many other colder experiences

—Chicago's Airport, an audience in Boston, or a hotel room in London in the winter.

Too Much Traffic. 5. Everybody thinks we flew over the Pole. I'm sure SAS isn't going to disillusion anyone, but let's face it. The North Pole was 800 miles away, although I must confess that we did fly pretty close to the North Magnetic Pole. It's wonderful to get credit for crossing the pole but shucks, we just didn't do it.

6. And talk about exploring the unknown of the far north: believe it or not, but we had to circle at Thule because of airport traffic! Seems that MATS is making Thule a busy traffic center this winter. It's getting so you can't carry on an expedition any place these days without bumping into traffic conditions. Very frankly it deflates pioneering morale to find airplanes all over the place. Nothing's sacred any more.

7. By this time you've guessed it. The trip was just fine, but believe me, it was a luxurious sky cruise, not a hardy expedition.

Women Like Cigars. I stayed in Copenhagen a day and two nights and I can report that the women are still smoking cigars. I attended a dinner of postal officials, honoring our U. S. Assistant Postmaster General Jack Redding, and one of the two women present pulled out a stogie and lighted up. The woman next to me said she didn't smoke cigars, for which I was grateful.

The Danish women are the only ones in the world, in quantity, who smoke cigars, although the other night at "21" in New York I saw a gal light one up. Ah to touch the delicate lips of a female who's been chawing over a good ripe cigar for a half hour! What aroma, what tasty saliva, what romance!

I'll Take Greenland. I spent four days in London and I'll take Greenland. I've never been so thoroughly cold as I was for the first two days when they were having a cold wave. It wasn't so bad outdoors, but the British have a way of refrigerating their hotels. I had a room at Claridge's, which is supposed to be one of the world's top hostels, but I just can't feel cozy in a room when I can see my breath.

It was so cold, in fact, that I wanted to open the window and let the outside air in. But I didn't dare do that. If I had, the cold air pouring out of my room would have frozen pedestrians right and left.

This was my first experience at the super de luxe Claridge's, only don't get the idea that it is as plushy as many of

our leading hotels, because it isn't. But it caters to prime ministers and kings and royalty and all sorts of costumed hot-shots from the Far East, and sometimes you can hardly distinguish the guests from the equally costumed hotel help.

Off the Lobby. I guess Claridge's was a little suspicious of just a plain old country guy from brash U. S. A. and didn't trust me to use the lifts. (Lifts are what you peasants call elevators.) My room was on the mezzanine right at the head of the main steps leading up from the lobby. So when I opened the door for my newspaper each morning I was practically in the lobby, pajamas and all. Sort of one rajah to another, as it were.

I must admit that the service at Claridge's was excellent, and I could get eggs for breakfast when I wanted them, although the kitchen hasn't the vaguest idea what three-and-a-half-minute eggs look like, but by all the heavens above, when are those English going to hear about this thing called heat?

Speaking of hotels, this was my fourth visit to London this year and the fourth hotel. It's nice to stay at Claridge's but I like to eat, too, and it's a question of whether you're going to pay your hotel bill or eat when you pick a joint like that.

Wanted: a Hotel. Won't somebody tell me of a good London hotel? I've stayed at almost twenty different places there and I'm still looking. Two years ago Warren Smith of Fairchild Engine & Airplane Corp. tipped me off to a small 45-room hotel in St. James Place called the Stafford. When Earl McKaughan of Trans-Texas Airways and I went to London last year we stayed there. The Stafford was just right. Good rooms, quiet, central location, reasonable in price, friendly help, good radio in each room, and just about everything except eggs for breakfast.

So I lined up the Stafford again this past September and again I liked it. I decided I was finally fixed. But I try a hotel three times before it makes the grade in my books and when I wanted to return there two weeks later, they said nothing doing. Booked up. They got me a room in the Dukes Hotel nearby, and I gathered that this ancient establishment was about the only building to have escaped the great fire of 1666.

I guess I can't really blame the Stafford. Small hotels haven't enough flexibility and have to sign up their rooms far in advance. At any rate, the light of my love, the Stafford, has been erased from my life. A short but sweet honeymoon.

Good Car Hire. Incidentally I've come onto a very good car-hiring service in London, in case you want a car and chauffeur. Quite reasonable, too. It's the J. Davy car hiring company, Logan Place, Kensington, with cars of every size from Fords to Jaguars. You can drive yourself, too, if you can master driving on the left side of the road. Car-hiring is a big business in England and highly recommended for visitors who want to save time and in many instances to save money.

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Top—Over-all view of cleaning section showing Magnus Aja-Dip cleaning machines at Chicago & Southern.
Lower—Engine parts after cleaning.



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C&S has just completed another step in its modernization program with the installation of a new engine cleaning section at its main overhaul base at Memphis, where it services its Constellation and Douglas aircraft engines.

With this new cleaning method, Chicago & Southern cleans two engines in the same time formerly required for one engine. In addition to being a faster, cleaner and more efficient operation, engine cleaning man hours have been cut in half.

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We invite your inquiries on any problems concerning connectors. Our wealth of engineering experience in this specialty is at your service.

Quick Disconnect

Simply push male and female members together and lock. To disconnect with minimum resistance, pull back sleeve on plug shell and disconnect. Exceptionally low disengaging force required (less than 6 lbs., excepting pin friction). Vibration proof, moisture-proofed with synthetic rubber insert. Meets AN pin pattern and voltage requirements, in accordance with MIL C-5015. Plug shell and coupling sleeve are aluminum alloy, cadmium plated and iridite-sealed. (Federal Spec. QQP-416, Type 2.)



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News At Deadline

Supersonic Bomber Production in Planning

Production contract for a supersonic bomber may be the outcome of talks now being conducted by the Air Force. Consolidated Vultee Aircraft Corp. seems to be the most likely production source, though no firm order has been let. Design studies were sponsored by the USAF at both Convair and Boeing, with the aircraft designated XB-58 and XB-59, respectively.

Truman Makes Awards At Wright Dinner

President Truman presented three major aviation trophies at the Aero Club of Washington's Wright Memorial Dinner on the 49th Anniversary of the Wright Brothers' first flight. Included were:

- Wright Memorial Trophy, to Lt. Gen. James H. Doolittle, USAF-RES., for long public service in the interests of aviation.

- Collier Trophy, to John Stack, Assistant Director of the Langley Aeronautical Laboratory, NACA, who accepted it in behalf of his associates who helped develop the first transonic wind tunnel.

- Brewer Trophy, to Maj. Gen. Lucas V. Beau, National Commander of the Civil Air Patrol, in behalf of the CAP, which was cited for its work in fostering aviation education.

Northwest To Buy Super Constellations

Northwest Airlines has reportedly decided to order Lockheed Super Constellations to supplement its 4-engine fleet. It is understood that Lockheed Aircraft Corp. will arrange to supply the airline with a number of early model Constellations pending delivery of the Super Connies.

Justice Dept. To Enter Colonial Merger Case

The Department of Justice has indicated to CAB Examiner Edward T. Stodola that it desires to participate in future procedural steps in the Colonial Airlines Merger Proceeding. The case now centers around charges that "prior control" of Colonial existed earlier this year when Colonial was weighing airline merger bids.

Butler At LaGuardia

Butler Aviation Inc., has signed a five year lease as the exclusive fixed base operator at LaGuardia Airport at New York, and has taken the entire Pan American hangar for storage, servicing and repairs of transient civil aircraft. Butler has large operations at Chicago and Washington. Robert Gill, who has been placed in charge at LaGuardia, will report to Washington manager Richard Fell.

No Comet Plans for NAL

National Airlines has disclaimed knowledge of its reported plans to buy Comets from some foreign operator for use on the New York-Miami run.

G. T. Baker, president, said, "I would sure like to know of a foreign airline that has a jet to sell that National could make money with. Like just about everyone else in the business, we have been looking at jets, but we can't find one that we could operate at a profit."

AMERICAN AVIATION Sweeps TWA Contest

The 15th TWA Annual Aviation Writing and Picture Competition was marked by a clean sweep in the trade journal division for AMERICAN AVIATION, which received the "sweepstakes" award for its "consistent excellence in aviation reporting."

Three AMERICAN AVIATION editors took the three prizes for individuals in the division, with Eric Bramley, executive editor, awarded first place for the best sales and promotion story of the year; James J. Haggerty, Jr., military editor, best operation and development story; and William V. Henzey, transport editor, best business and financial story.

For Bramley it was the seventh such award and for Henzey, the fourth.

No Stretch-out Asserts Gilpatric

There has been no recent stretch-out to further postpone the 143-wing Air Force, according to USAF Under Secretary Roswell L. Gilpatric. Output for November was 666 planes, as contrasted with 365 aircraft accepted during November, 1951.

Gilpatric admitted some "bugs" in the production program, including aluminum blade trouble on the J65 engines, a drop in F-84F deliveries, and trouble with the F-89 interceptor, but asserted that these would not interfere with scheduled attainment of 143 wings by the end of 1955.

Channel Wing Proto- type Due for Testing

A prototype aircraft equipped with the Custer "channel wing" is scheduled for delivery on December 24 and for flight testing during the beginning of 1953. The plane will be a five-place Baumann Brigadier, being produced under a special license arrangement between Baumann Aircraft Corp., Pacoima, California, and Custer Channel Wing Corp., Hagerstown, Maryland.

A 10-mph landing speed is claimed for the Brigadier, with a 3,000 ft./min. rate of climb and a cruising speed of 275 mph. The two engines, each 260 hp, are set in "channels" just outboard of the wing root, at which point the wing is shaped into a trough having approximately the diameter of the propeller.

Air Freight Rise Forecast by Norden

Sharp increases in trans-Atlantic air freight "despite the attitude of the Civil Aeronautics Board" are predicted by Raymond A. Norden, president of Seaboard & Western Airlines. By 1955 Norden foresees a total of 160 million ton-miles, an increase of 340% over 1951 traffic. The total should reach 450 million by 1960, he believes.

Norden accuses the CAB of wanting to protect "the 'grandfather' passenger airlines against competition."

Northeast Strike Talks Move to Washington

Mediation talks in the strike of some 200 Northeast Airlines maintenance workers have moved to Washington. Representing the carrier is President George Gardner; acting for striking workers is Elmer E. Walker, general vice president of the IAM. Federal mediator is George S. McSwan.

Strike is over wage boosts, with demands running up to a 25 cents an hour figure, and company offers ranging from six to 12 cents an hour.

APPOINTMENTS

New Defense Air Transportation Administrator is **Tod Hardeen**, attorney and oil operator, who replaces **Robert Turner**. Turner has returned to his duties as vp-sales for Northeast Airlines.

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New director on Braniff Airways board is **William A. Blakely**, Dallas attorney and insurance company board chairman.

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Col. B. L. Anderson, vice president of Philippine Air Lines, has been elected to the board of directors of the company. Four other PAL executives have been named vice presidents, including **C. N. Biondi**, who has become vp-general traffic and sales manager, with additional functions as European regional director, and **Col. W. L. Hurd, Jr.**, who becomes vp-general operations manager.

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Third president for Resort Airlines within a year is **Clinton Davidson, Jr.**, board chairman of Resort, who succeeds **R. Paul Weesner**. Weesner, president since February, has "resigned as president and director after disposing of all his stock in Resort."

Harold L. Graham, former Pan American official who joined Resort in October, has been named executive vice president and director.

Predecessor of Weesner was **Lewis C. Burwell, Jr.**

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Adm. Emory S. Land has been re-elected president of the Air Transport Association. **C. C. Hubbard** executive secretary of the Air Traffic Conference, was elected vice president-traffic, a position that has been vacant since the death of **M. F. Redfern**. All other officers were re-elected.

Three new directors were named to the board: **T. E. Braniff**, president of Braniff Airways; **Robert F. Six**, president of Continental Air Lines, and **John H. Connelly**, president of Southwest Airways.

Frye Trophy for Speed Goes to Panagra

First award of the Frye Trophy for the fastest U. S. commercial passenger flight on regularly scheduled service has been given to Pan American-Grace Airways. Panagra's DC-6 E1 Inter American flight between Miami and Buenos Aires won the award with its schedule of 16 hours and 16 minutes over the 4,587 mile route.

ATA Helicopter Study

A study of helicopter possibilities on scheduled routes will be the function of an ATA committee, members of which are still to be named. Reliability as well as costs, traffic, and operating problems on certificated routes will be included in the study.

TWA Surveys Orient

A survey flight has been run by TWA investigating the possibility of a Tokyo-Bombay air route, with favorable response reported. Conferences with local businessmen were held in New Delhi, Calcutta, and Colombo, Ceylon.

Local Service-Trunk Cooperation to Increase

Closer cooperation with the trunks will be the watchword of the local service lines, according to agreements reached by the latter just before an ATA management session. The meeting, headed by **Frank Hulse**, president of Southern Airways, heard a report of the current status of the Canadair CL-21 and the Fokker F-27 by **T. H. Davis**, president of Piedmont.

Coordination in Govt. Needed: Patterson

Re-examination of recommendations which would set the Interstate Commerce Commission up as a "moderator, coordinator and court of appeals" for other Federal regulatory bodies was urged recently by **W. A. Patterson**, president of United Air Lines.

"Multiple agencies," Patterson said, "cannot go on making decisions on broad questions of policy without some consideration as to where interests and controls overlap or come in conflict." He emphasized, however, that he is not "recommending at this time a single regulatory agency for all transportation..."

ALPA-Behncke Settle Pension Dispute

The prolonged disagreement between **David L. Behncke**, founder of the Air Line Pilots Association-AFL, and the current union membership and officers has finally been settled. After weeks of negotiations, Behncke has accepted a guaranteed \$7,500 a year annually for the rest of his life in return for giving up all claims to the ALPA presidency, now held by **Clarence N. Sayen**.

The contract, which has been approved by Federal Judge **Walter J. LaBuy** in Chicago, also enables ALPA to recover more than \$20,000 of the attorneys' fees paid out during a year of court battles.

When ALPA's executive board first ousted Behncke in July, 1951, it voted him a \$15,000 annual pension. But after he took the case to U. S. District Court and later the U. S. Circuit Court of Appeals, the board decided to eliminate the pension completely.

Eastern to Remain In Air Transport Assn.

Eastern Air Lines has withdrawn its resignation from the Air Transport Association and will remain within the organization. No reason was given for the action.

Last June, **Capt. E. V. Rickenbacker**, EAL's president and general manager, had announced that the airline would leave ATA on December 31. Announcement followed an ATA meeting at which the directors voted not to extend the leave of absence of **Robert Ramspeck**, ATA executive vice president, who was serving as chairman of the Civil Service Commission. He had requested extension to give President Truman time to replace him at CSC. Ramspeck wished to return to ATA, but only with the early prospect of becoming president, it was said, and several members refused to vote for his being top man.

NMB to Settle Wages as EAL Engineers Return

A week-long strike by about 160 flight engineers for Eastern Air Lines—a walkout which caused EAL to suspend virtually all Constellation and Super Constellation service and lose about \$1 million in revenues—came to end when the FEIA-AFL members agreed to return while the National Mediation Board continued efforts to settle the wage issues.

During the walkout, the strikers ignored a company deadline to get back to their jobs and EAL subsequently decreed that the employees had "resigned." Eastern started using flight engineer supervisors on Connie trips between New York and Miami and announced plans to begin training new flight engineers. This program, however, was abandoned and the "resignations" were ignored when the members of the Flight Engineers International Association agreed to return.

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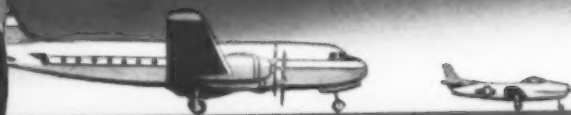
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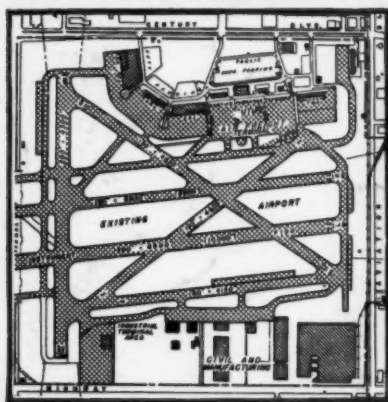
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